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ORIGINAL PAPERS.

OUR CANAL POPULATION AND THE CANAL BOATS ACT OF 1877, AND THE AMENDING BILLS OF 1881, 1882, 1883, 1884.

By GEORGE SMITH, of Coalville.

FOR more than a century our canal-boat toilers have roamed over the country with their floating homes, carrying goods and spreading disease and immorality, which have, in sadly too many instances, left unhealthy influences on their track.

The science of sanitation and the blessings of education were, and are still, almost unknown to our canal-boat workers. It is fearful to contemplate the amount of infectious diseases that have been carried from town to town and village to village during the last century.

Within the last few years 2,000 deaths took place in a very short space of time in one of our large towns, which disease, the medical officer of health said, was introduced to the town by a canal boat; in fact, it is to be feared that hundreds, if not thousands, of deaths have taken place since the passing of the Canal Boats Act of 1877 by infectious diseases, that have been carried to various parts of the country by canal boats and travelling tents and vans.

A boat from Staffordshire, with several children having small-pox on board, was for some days last summer among a number of boats, upon which and round them there were some hundred men, women, and children, of all ages and sizes, at Lower Heyford Ironworks, and unchecked by either the sanitary inspector or doctor until brought to bay by Mr. Collins, the manager. How long it had been moving to and fro among the boats in the Staffordshire and other districts before it arrived at Lower Heyford I could not learn.

A few months ago I came upon a boat at Braunston in which there were five children fearfully ill of fever. In addition to the five children there were a man, woman, and a 'chap.'

Recently a boatman lay ill of a most dangerous fever in a cabin in Staffordshire, and while he lay there his wife was confined of a baby by his side.

Within the last few weeks a canal boat carried small-pox from Worcestershire to Gloucestershire; and, more recently still, it has been conveyed from near London to some of the midland towns. In the boat there were man, woman, 'chap,' and five—some say six—children. The woman, instead of stopping at her cottage home in the country, as she could afford to do, and educating their children, had preferred to huddle together in the cabin, not six feet square, and to put their linen out to be washed where small-pox was at work; and it is to be feared that, in defiance of the Canal Boats Act of 1877 and all sanitary and educational laws, the seeds of this dreadful disease will be producing a crop of work for the doctors and sanitary officers where it is the least expected.

After some years of hard work and agitation, with a view to secure the education of the canal children, and the placing of their floating homes under proper sanitary laws, and also to prevent the fearful amount of promiscuous huddling together there is in the

cabins of both sexes and all ages, the Canal Boats Act was passed, based on a memorial I drew up in 1873, and which was signed by seven boatmen, only one of whom could write his own name, and is as follows:—

'We, the undersigned, think and speak, from conversations we have had with other boatmen, that no child under thirteen and no female under eighteen years of age should be employed on or allowed to sleep in canal boats. The cabins should be so made as to allow of proper ventilation, and not less than 100 cubic feet of space for each person. Power should be given to the workshop or sanitary authorities to enter a boat at any time, and either detain or order to be removed any person suffering from infectious diseases on board. The name of the owner, the number of the crew, and date when last examined by the inspector should be painted in a prominent place on the boat. Our children ought to be educated and protected as children on other work are. We regret to think that not more than two out of every 100 under the age of fourteen can read or write, and not more than five out of every 100 attend a place of worship on Sundays.'

After no little amount of trouble I succeeded in inducing the Government, in 1875, to allow the Royal Factory and Workshops Act Commission to inquire into the condition of our canal population; the chairman being Sir James Fergusson, vice-chairman, Lord Frederick Cavendish, and the secretary, Sir George Young. The result, after hearing a mass of evidence from boatmen, boatwomen, canal proprietors, agents, factory inspectors, magistrates, and others, was that they recommended in their report that no women and children should be allowed to live in the cabins at all, which cribbed homes, I say most certainly, were never intended to be sleeping quarters for more than two or three men or youths. So long as the canal traffic was chiefly in the hands of the canal proprietors, the evils of huddling promiscuously together had been fairly kept under control by pressing their own regulations. Now the canal proprietors concern themselves more about the traffic itself than the people engaged in it, and have, as a consequence, lost all moral control over the boat people, as the boats are no longer owned by them. This state of things opened the cabin doors for the women and children wider than they had ever been before—the boatmen not caring to shut them—with a sad result not only easy enough for a child to see, but a result that has told its tale upon the country, and upon the boatmen themselves. We may shut our eyes to the fact; nevertheless, the fact remains, viz., that the boatmen and their families of to-day are not so healthy as the boaters of the past generations. Disease is more rife among the children, bottles of physic are more frequently called for at the chemists, as they move through the country, and the hoarse, gruff cough and voices are more noticeable among the women than formerly.

An English narrow canal-boat cabin is about 8 feet 6 inches long, 5 feet 6 inches wide and 5 feet high, and is the floating home of a boatman and his wife and three, four, five, or six children of both sexes and all ages and sizes, with a 'chap' frequently into the bargain.

In this little space boaters are born, live, and die; and it is in this *little place* that nearly all their larger, kitchen, parlour, and bedroom requisites are stored.

The foul, poisonous atmosphere arising from the boatmen and their families when they are crouched in their *little beds* is at times, as they have often told me, 'enough to poison pigs.'

It is only fair to say that some of the boaters are as respectable as any other class of workers, and their homes as 'clean as pinks.'

The appearance of our boating population, taken as a whole, presents the features more marked, especially among the children, than when I first became practically acquainted with the boatmen and their families, some forty years ago; that is to say, the stout, strong and healthy boaters are not so numerous as formerly, and their places are being filled up on the one hand by the thin, poor, haggard, careworn and dejected creatures.

To my mind the two main causes of this are, first, the unhealthy state of the cabins and want of proper ventilation; second, working in their damp clothes—for the women and children have no convenience to dry them when they get wet; and, thirdly, to the amount of drinking they indulge in; for on an average throughout the country a boatman will spend six shillings per week in beer. But the question which arose in my mind whenever thinking the subject over during a lifetime of observation, but more especially since I began the agitation in 1872, was how to get rid of the evils surrounding boating life.

My long experience has taught me this: if action is taken wisely, two of the evils can be dealt with by laws that are applicable to the rest of the community; in fact, they have been slightly applied by the powers that are already in the Canal Boats' Act of 1877, but not so much as is desirable. Overcrowding in the cabin continues, and the education of the children is an object not yet accomplished. The third evil must be got rid of, chiefly, by moral and philanthropic agencies and influences.

Inspection under the Act of 1877 is little better than a farce. Some of the registration authorities of the Local Government Board have taken no steps to carry out the Act of 1877. Others have appointed officers to see to it, but have not given any salary for doing the work. That part of the work, namely registration, for which the sanitary authorities have received a fee of 5s., has been partly carried out. Eight thousand boats have been registered, with many thousands to follow, which registration, if the system of registration I recommend is not continued, so as to be able to tell who owns the boats and the names of them who live in them, will be worse than useless. The local inspectors appointed by the registration authorities have come from the ranks of policemen, surveyors, medical officers, and sanitary inspectors, and some sanitary authorities have been appointed registration authorities against their wish. Thus it will be seen that the system of inspection at present carried out is all 'heads and tails,' 'topsy turvy' fashion, and in anything but a satisfactory manner. Carelessness, apathy, and indifference have run through the inspection and everything connected with the Acts from the day it came into operation to the present time. With these failing points and difficulties staring us in the face, it has become an imperative and absolute necessity that, if the little good that has been gained by the Act of 1877 is to be maintained, the seed sown to bring fruit, and the fabrics, which are to be an ornament to the land, reared upon the foundations laid in 1877, the close upon 30,000 canal children educated—not

10 per cent. of whom can read and write—the spreading of disease stopped, habits of sobriety, morality, and industry encouraged, the Act of 1877 must be amended on the lines I have laid down in the Amending Bill, and described in my works—and in my evidence before the select committee on canals last year—a Bill which has been before Parliament during the last three sessions.

Last year the Bill was read a second time, and referred to the Select Committee on Canals, and they reported it back to the House of Commons without amendment. As the Bill now stands it has been read a second time this year and referred to a select committee. Each year the Bill has been 'blocked' at the instance of the Canal Association on the plea that it will interfere with canal traffic. This I deny most emphatically. The carrying out of the Act on the lines of the Amending Bill will give an impetus to canal traffic, and bring health and happiness to the toilers.

The failing points of the Act of 1877 are—1. The Act, to a great extent, is permissive. 2. Proceedings cannot be taken against boatmen and boat-owners for breaches of the regulations. 3. The Act is placed entirely in the hands of the local authorities, which are, as a rule, twenty, thirty, forty, and fifty miles apart. 4. The non-annual registration of the boats. 5. The want of power in the Act to enable the Local Government Board to appoint officers to supervise, control, enforce, and report to Parliament the working of the Act, and to visit the boats working between the registration districts. 6. The want of power to enter the boats at reasonable times to inspect them. 7. The want of power to give the education officers power to enter a boat cabin to see to the education of the children. 8. The payment of a week's fees demanded from boat children who can only attend one or two days in the week. 9. Many boats, in coal and other districts, escape registration and inspection on the plea that the boats are not used as dwellings. 10. The fines, instead of being paid to the county fund, should be paid to those who institute proceedings and do the work. 11. There is no provision made in the Act or in the regulations for the transfer of boats by sale or otherwise. My Bill remedies these faulty places.

Clause 1 provides for the annual registration of the boats, upon which the success or non-success of the Act of 1877 and the Bill I am promoting depends, and I propose at a cost of not more than five shillings. At any rate, if the boats are not registered annually they must be registered every time a change takes place in the captains or masters, which would be a troublesome and an expensive affair, owing to the frequent changes taking place, often several times during the year. Nor would it be wise and practical to put a canal boat and her cabin crew through the same forms, ceremonies, and difficulties that ships and ships' crews have to undergo every time a change of ownership and crew takes place.

The process I propose is both extremely simple and inexpensive, no matter in what part of the country the boat happens to be at the time of the annual renewal of the registration certificate. I will only take one case to illustrate my meaning upon this point. Suppose a boat is registered at Paddington in the first instance, but at the end of the year the boat is working on the canals near Birmingham. To compel the boat to be brought from Birmingham to Paddington for the renewal of the

gistration certificate would be a great and unnecessary hardship inflicted upon boatmen and at-owners. What the captain would have to do would be to ask the registration-officer at Birmingham to examine his boat, and, upon its being satisfactory, he would give the captain a note to that effect, which note the captain would send to the Edington registration officer, upon which the officer would forward the proper certificate of renewal registration.

Up to the present time the Local Government Board have had no power to enforce the carrying out of the Act of 1877. All they could do was to make regulations, which the Manchester and other authorities say, in effect, are not worth the paper they are printed upon. Clause 5 of the Amending Bill gives the Local Government Board and the Education Departments power to see that the Act of 1877 is properly carried out, and is as follows:—

1. The Local Government Board and Education Department shall from time to time cause inquiries to be made as to the due observance of the enactments contained in the principal Act, and in the regulations made thereunder, with respect to the registration of canal boats, the education of children travelling on board canal boats, and other matters relating to the execution of the principal Act and this Act.

2. Every inspector of the Local Government Board and Education Department shall, for the purpose of any inquiry under this Act, have in relation to witnesses and their examination, the production of papers and accounts, and inspection of places and matters required to be inspected, similar powers to those which poor law inspectors have under the Acts relating to the relief of the poor for the purposes of those Acts, and power to enter any canal boat at all reasonable times.

3. The Local Government Board and Education Department shall, as soon as practicable after the meeting of Parliament in every year, cause to be laid before both Houses of Parliament a report as to the proceedings of inspectors appointed under this Act, and generally as to the execution of the principal Act and this Act.

4. Such part of the fees paid in respect of registration under the principal Act and this Act as the Local Government Board from time to time direct, shall be applied towards the expenses of inquiry made under this Act.

Instead of the sanitary authorities doing the work, and finding the necessary money to enforce the provisions of the Act and the regulations of the Local Government Board, without any power over fines, Clause 10 of the Bill is intended to put the matter right and reads as follows:—

1. One half of any fine recovered under the principal Act or this Act shall go to the informer, and the remainder to the sanitary authority (as defined in the principal Act) of the district in which the offence is committed.

2. Provided that where the sanitary authority are informers they shall be entitled to the whole of the fines recovered.

3. All sums payable to a sanitary authority under this section shall be paid over to their treasurer, and shall be carried over to the account of the authority applicable by the authority to the purposes of the Act.

Clause 11 of the Canal Boats Act, 1877 (Amendment), Bill, deals with our gipsies, van, show, and other travelling children and their homes, and reads as follows:— ‘The expression “Canal Boats,” “Canal Boat,” and “Boat,” in the principal Act and this Act, and also in the regulations of the Local Government Board and Education Department, shall include all travelling and temporary dwellings not rated for the relief of the poor.’ It was stated to the Committee that vans and like places are not canal boats, to which I replied that the principles involved and objects sought are the same; and the same machinery from beginning to end would have to be brought into motion to carry out the plans I propose. It is only a question of the term used or name given. In one case a home moves upon water, and in the other case a home moves upon land.

A thousand things far wider of the mark and object are brought under various acts of Parliament. Take, for instance, the wide scope of our factory, mining, and educational laws, or hundreds of other Acts of Parliament that are placed upon the statute-book.

It is time our canal and canal-workers were put upon a satisfactory basis, and if the boatmen do not get sufficient money to make them comfortable homes on land, it is high time they did, and this can be done by lowering canal tolls, increasing canal traffic, making canals of greater depth and width, capable of carrying boats of from two to three hundred tons burden—in the way I have indicated for many years—and the putting of the whole of the canal system under proper supervision and control, as other industries are.

Prayers and sighs have gone to St. Stephen's from friends in all parts of the country—diocesan conferences, Birmingham, Manchester, London, and other school boards, borough corporations, and quarter sessions—in favour of the Canal Boats Act Amendment Bill. The Essex Quarter Sessions, composed of about 250 leading county gentlemen, including peers, lords, M.P.s, baronets, and squires, at the instance of Mr. Andrew Johnston and Mr. Pierce, passed a unanimous resolution in favour of the Bill, and with no further response from headquarters to their action and my long, long years of toil than ‘Go thy way for this time, and when I have a more convenient season—session—I will send for thee.’ Will it ever come? I begin to doubt it.

PENNY DINNERS FOR SCHOOL CHILDREN.—The Rev. W. Moore Ede, rector of Gateshead, has been trying the experiment of penny dinners for poor school children. The result of the first week's experiment was a profit of about seven shillings on nearly 500 dinners, and this, the rev. gentleman says, ‘has not been obtained by placing the children on short allowance. They have had each day as much as they could eat; for, unlike *Oliver Twist*, they have been allowed to ask for more as often as they pleased. One boy was heard to boast that he had sent in his plate eight times, and five helps were common.’ Mr. Ede suggests that the system of penny dinners should be established in connection with all our National and Board Schools, or, at any rate, those in poor districts, and he affirms that the scheme will be absolutely self-supporting.

At the last meeting of the Blaydon Local Board it was stated that there were a dozen cases of typhoid fever at Black Hall Mill, which arose from the deficient or polluted supply of water at that place. There was also a total absence of drainage.

THE COMMUNICABILITY OF ENTERIC FEVER.

By ALEXANDER COLLIE, M.D.

[Having received the appended query from a subscriber, we submitted it for reply to Dr. Collie, who has kindly gone into this important question at such length that we deem it advisable to publish the information sent in an independent form.—Ed. S. R.]

Being Sanitary Inspector of a large district I write to ask your opinion upon the subject of typhoid fever. Is it communicable *from person to person*? The District Medical Officer of Health is of opinion that it is. Poor Law Medical Officer of great experience here is also of that opinion; but a young doctor recently established sneers at the above opinions as being those of 'old fogies' of the profession, and states that in London hospitals—St. Bartholomew's, for instance—typhoid cases are habitually treated in the same ward with other patients. May I also ask if the majority of the profession—so far as you are aware—agree with the 'old fogies' or with the young lights?—I am, Sir, your obedient servant,

June 25, 1884.

M. S. E.

DR. BRISTOWE probably expresses the opinion of the profession on this question when he says:—"It is admitted by most physicians that enteric fever is not in the usual sense of the term contagious; that it is not conveyed from one person to another person by the touch or by the breath; and that attendants on the sick rarely, if ever, take the disease from them; yet it is quite certain that the immigration of a patient suffering from enteric fever into an infected locality not unfrequently leads to an outbreak there." The phrase 'the usual sense of the term contagious' is somewhat vague, and it would be well if the precise meaning of 'contagious' in the *usual* and the *unusual* sense of the term were definitely determined. There is also some contradiction in the statement that the disease is not contagious, and 'that the immigration of a patient suffering from enteric fever into an uninfected locality not unfrequently leads to an outbreak there.' Why, if it be not in some way contagious? Further, the statement 'that attendants on the sick rarely if ever take the disease' can no longer be maintained in the light of recent experience. Take the Homerton Fever Hospital as an example. It has been open as a fever hospital for about eleven years, and during that time about thirty persons contracted enteric fever, twenty-eight of whom were attendants upon the enteric sick: one was a laundry woman, who collected soiled linen from enteric fever wards, and one was a nurse, the origin of whose case was doubtful. On this point the experience of the Homerton Smallpox Hospital is very curious. From Feb. 1, 1871, to Sept. 19, 1879, 6,771 cases of smallpox and 171 cases of scarlet fever had been treated there, and during the same time about 487 persons had been employed in attendance upon the sick and otherwise; but during all that time, a period of about nine years, no case of enteric fever had occurred among these 7,000 persons, a large number of whom, being young persons, were of the susceptible age. But on Sept. 29, 1879, the Homerton Smallpox Hospital was opened for enteric fever, and within six weeks there were two cases among the nurses who nursed it, followed by a third a little later, and by a fourth at the end of three months in the person of a

porter who bathed the male enteric patients. Feb. 7, 1880, the smallpox hospital was closed for enteric fever and reopened for smallpox; and from time to time there has been no enteric fever at Homerton Smallpox Hospital (Gayton). The experience of the Homerton Fever Hospital is essentially the experience of the other fever hospitals. Till the six years 1878-83 eight nurses and attendants contracted enteric fever in the London Fever Hospital; and during the same years seven nurses and attendants contracted enteric fever in the Homerton Fever Hospital. The Hampstead Hospital was opened for enteric and scarlet fever in October 1882. Very few cases, especially enteric, were admitted until the autumn of 1883, when the wards were fairly full. Then three arose, two amongst nurses who were nursing enteric patients, and one in a housemaid who frequented the enteric ward. The experience of Deptford Smallpox Hospital is similar. Whatever then be the explanation, the fact that attendants upon cases of enteric fever contract the disease is beyond dispute. The experience of the general hospitals is similar to that of the special hospitals of which the following is a striking example.

'The Committee regret to inform the Government that during the latter part of the year seven persons were laid up with typhoid fever, one of whom unfortunately died. Although the drains of the hospital had been carefully inspected so recently as in the spring, the Committee considered it desirable to have them again thoroughly examined. This was done on two separate occasions, under the direction of Mr. Yuill, a member of the Committee, who had great experience in such investigations, and Mr. Harvey, the architect, when powerful tests were applied to ascertain whether any defects existed, and the Governors will be glad to hear that no defect was found in the condition of the drains that could account for the illness of the nurses. All the nurses who were laid up with typhoid fever had been engaged in nursing typhoid cases; and this fact seems to indicate that the opinion of the medical profession as to the non-infectiousness or non-contagiousness of typhoid fever may probably, in the course of time, have to be reconsidered.'—*Annual Report of Royal Free Hospital, 1883.*

Dr. Donkin and Dr. Sharkey record, in the *British Medical Journal* of Nov. 6, 1880, similar experience in respect of the Children's Hospital at Shaftesbury and St. Thomas's, and in the same number Dr. McNeill describes an epidemic of enteric fever which was imported into Colonsay and spread there in no other way than from person to person. French opinion is not less decided. Thus, after discussing the opinions of Leuret, Germain and Bretonneau, who all hold that enteric fever is contagious, concludes: 'It appears to me hence impossible, after what has preceded, to deny the contagious character of the typhoid affection at Paris, for there can be no doubt of the nature of the disease observed by M. Bretonneau. M. Germain and those who share their opinions. The symptoms observed by them during life, and the lesions observed after death, are the same as among the individuals attacked with the affection of which we are speaking, "et comment admettre que la maladie soit contagieuse à Tours et à Châteaubleau, et ne le soit pas à Paris?"' Dr. Germain writes to the same effect:—"A considerable number of the reports which the Academy receives

the epidemics which prevail in the departments convince one that "la contagion de la fièvre est un fait acquis désormais à la science." enteric fever may be treated with safety to patients in the general wards of a hospital; this does not in the least show that it is not so, but only that in certain circumstances it is so. In particular, where the ventilation of the cubic space is abundant, and the general precautions complete, it does not spread at distance; but that under such circumstances it does not spread far is no evidence that it does not at all. By due attention to the conditions of typhus, enteric, and scarlet fevers are treated together with impunity; and when it is known that the infective matter of the enteric fever is for the most part contained in his stools; these are passed into vessels which are immediately removed from the ward and emptied into the street, there remains nothing to infect the non-enteric in a general ward, and consequently there is no surprise in the fact that such patients do not contract enteric fever. It is quite otherwise with nurses. These are in close contact with the patient; they have to remove their excreta, empty and wash the bed-pans, collect and remove their soiled clothing, clean them, and move them about. Their position, therefore, in relation to the patient is entirely different from that of the other in a general ward, and the difference is shown by the fact that they do frequently take the disease. Now they do so may not be quite so clear. It should, moreover, be remembered that enteric is a disease of childhood and youth, and that consequently a large number of nurses are probably previous attack.

S. ROBERT BOYLE & SON'S Patent Self-acting Air Ventilators have just been applied by the Admiralty to the drainage system at Sheerness Dock-district. Boyle have also recently applied their system of ventilation to the General Post Office, Liverpool; General Post Office, Leeds; Grand Hôtel de la Mer, Marseilles; Albert Memorial Museum, Brixton Town Hall; Rochdale Free Library, Rochdale; New Public Baths, Forest Hill; and the house of the Good Shepherd, Hammersmith.

SANITARIANS.—In the course of the discussion followed Dr. Corfield's paper on 'The Spread of Diseases,' read at the International Health Conference on June 14. Dr. Walford remarked that 'There is nothing new in sanitation; the earliest medical officer, and perhaps the best, was Moses. The principles laid down by him were of the very best, though, naturally, they were better fitted for dwellers in tents than residents in large towns. (This aspect of the question was fully dealt with by Mr. Ernest Hart in his paper on Mosaic Sanitation, delivered some years ago at the Jewish Working-men's Club.) Dr. Walford added that Cyrus fully understood the value of sanitation, only drinking the produce of one particular field that boiled.'

THE LANCET Parliamentary paper gives the number of cases found in the river Lea in the years 1882

In all, eighty-five bodies were found in this river these two years, and the result of the coroners' verdict upon them was a verdict in thirty-five cases of natural death, in one of wilful murder, and in eight cases of suicide; while in forty-one cases no opinion was expressed by the jury as to the cause of death.

DRAIN-TESTING.

By HENRY MASTERS.

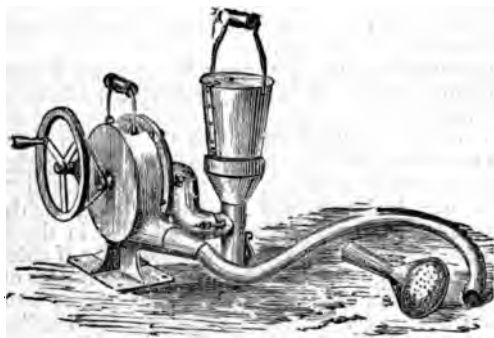
SOME few years since a letter appeared in a contemporary drawing attention to the importance of house-draining being free from leakage, and advising every one who had a drain in their house, to procure a certain quantity of ether and pour it down a sink or closet, and then, if any defect existed, the ether would escape and the defect be discovered. This amateur system of drain-testing took immensely with the public, and, I dare say, there was a run upon the ether market for a time, and even now I meet with people who have just tested with ether. The letter did good, for it taught the public that it was important that their house-drains should be sound and free from leakage. There are in England and Wales about 4,000,000 houses, and I should not be astonished that, if these were tested, at least 3,000,000 would be found defective.

Drain-testing by strong scents is not a new thing, for in my early days (nigh fifty years ago) I have a vivid recollection that if water in which cabbage had been boiled was discharged into the kitchen sink, its odour invariably escaped into the cellar, up the staircase, and, I dare say, the air of the reception rooms and bedrooms did not escape being highly charged with this vegetable test; but then in those days everybody considered it the right thing, if able, to have drains under their houses. As a matter of course, such drains must emit a bad odour, or how should a stranger be able to discover the locality of that useful appendage to a house—the water-closet. 'Follow your nose,' was the order of the day, and your nose seldom played you false. In these latter days we are more alive to defects in drains, and drain-testing has become quite a business, and consequently we have all our fads in this direction; one is strong for chemicals, another for smoke, another for filling with water, and another trusts to the sense of smell to detect the natural drain odour, and the latter class of testers are legion, and they are generally of 'opinion strong,' for, say they, if you cannot detect any drain odour the drains must be perfect. As I have for many years practised in each and every of these testings, I will give my experience, and in doing so I trust that I shall throw some light upon the question of drain-testing, for I find that some of those who ought to know are not all so well-informed as they should be.

I take rather a broad view of this drain-testing, for I do not believe that either of the systems enumerated above are applicable in all cases. Take, for instance, the case of an old house; you want to know if the drains are free from leakage, and your client will not hear of breaking ground, as he feels sure all is right, for he has constantly had traps put in. Now these traps are the rub. There is a trap at the closet and at the foot of the soil-pipe; another at the end of the passage, another under the cellar, another just out of the house, and another close to the common sewer, or cesspool. So here we have the drain divided into six sections, or pockets, and it is found that water passes freely from the water-closet to the cesspool, for you can hear it enter that receptacle by applying your ear to the bung-hole of the man-hole stone, or cesspool ventilator. To apply a smoke test in a case like this would be absurd, for the most you could do would be to try one or two sections through a sink or bung-hole, but if you put

carefully a strong peppermint oil, ether, aniseed oil, or nitro-benzole, and plenty of hot water to follow, the chances are you may fairly test the drain from end to end, and may find if this test has been effective by applying your nose to the bung-hole or ventilating pipe, and so discover if the test has gone from end to end. The advantage of the chemical test in such a case as I have described is that no trap in the line of the drain will interfere with its free action, for wherever the drainage flows the test will also flow, leaving particles upon the sides of the drain; so you have a long line of scent from closet to cesspool, and, if proper precautions are taken, you will be able to discover about the locality of the fault, if any.

If we have laid down new drains, and know where the traps are, there is no better test than smoke by the fan, and the machine made by Messrs. John



Watts & Co., engineers, of Bristol (who also supply test-paper), I believe to be the best in the market; at any rate I find it handy and effective, and, if packed in a box, is not a heavy package to travel with.

Water-testing has its limits, for seldom will a system of drains stand water pressure. Take a case; a small house has a 6" drain from back to front, is trapped at the sewer, has a scullery and a yard sink. The trap and sinks are plugged securely, and you let on the first-floor water-closet service pipe, until the basin is nearly full; all at once the water sinks, for something has given way; probably an underground pipe burst. You inquire into this, and find that the drains have been submitted to a pressure of about 12 lbs. per square inch. This upon the 6-inch pipe is more than 200 lbs. per inch run. To my mind this is a pressure that no drain should be submitted to, for drains are not made to carry high pressure water. It may be said that should a stoppage take place in the underground drain, everything should be strong enough to resist the water rising in the soil-pipe; but this can seldom, if ever, take place, for an escape at the scullery or yard-sink would at once draw attention to the stoppage. Water-testing is very well for a ware drain that has 3 or 4 feet rise, but nothing above that height should be filled with water, except the drain is of iron. There is this advantage in a water test—you fill the pipes and watch the effect; if it falls but slightly it shows that there is a leak somewhere; if they are tested before being covered up you can detect the spot; but if the drain is covered the whole must be opened and examined, for the leaking water will travel under the pipes for many yards and possibly be absorbed by the soil. Water-testing should only be tried upon new open drains, and after the cement-jointing is

well set. Some consider that a soil-pipe is tested by water—if the pipes are strong, well good; but I have a lively recollection of soil-pipe being so tested, and the lower end pipe gradually assuming a leeklike shape. In testing by water it is well to be provided with turned plugs of several sizes, about three long, covered with India-rubber. Some leather cups, with plugs of cork inside them.

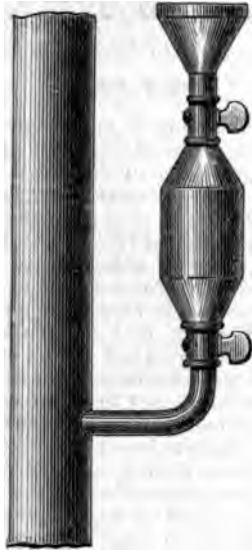
Upon applying the smoke test it is necessary to take some precautions. All outlets (such as openings) should be plugged, and also the end of the drain should be cut off; for I have known when a strong current set in the direction of the main sewer, in which circumstances the smoke would be found to pass from the house into it. You must also regulate the quantity of material according to the capacity of the drain pipes to be tested, for a mansion will require more smoke than a cottage; and if you can cut a hole into the drain at several places, and cork one up, an examination of cork after cork will show you that smoke is present at certain points and disclose if the drain-pipes have been laid in pockets or accidental cesspools, caused by the layer allowing the pipe here and there to sink. In some cases you will find a difficulty in getting the pipe to make a hole into it. In such cases a gully or trap outside the house, or even the sink, extract all the water from the trap, sponge, and insert the smoke-pipe, bound with a duster or house-cloth, or a flexible tube, be passed through the trap water, and the water expelled by your breath. The great advantage of smoke-testing is that you can see, as well as smell, the exact locality of the leak, or at any rate you can follow the smoke to the defective part, as it is of a strong flavour, flavouring the earth and the air. In some cases I have known it leave a tint upon the earth. With the smoke test you do not require to be so careful of handling the material as in chemicals, for touching a peppermint cork will scent your fingers or dress, and will occasionally give a false scent; therefore too much caution cannot be taken in chemical testing.

The sketch herewith shows a suitable receptacle for carrying your chemical apparatus; it is divided into parts, the upper a Gladstone or other apothecary leather receptacle, and should contain a set of tools, viz., a square-faced and pointed back-saw, a logical hammer, useful for cutting a small hole in a ware pipe, and also as a centre punch.



American drill, to make 3-16th inch holes in pipes; a square rimer; a screw tap, such as used by gas-fitters; a curved pipe, with tapered ends, for fixing into a soil-pipe; several receptacles for chemicals, which may be screwed upon the curved pipe. These receptacles have taps at the bottom and top, and the contents are discharged in

pipe by opening the under tap first and the upper afterwards, and the chemical will pass down by



gravitation ; but it may be advisable occasionally to screw a funnel on the upper end, so as to run some water through from a jug. This test is better applied out of doors, if possible, for it is next to impossible not to allow a small escape. Some lead or gutta-percha plugs, to screw into the pipe holes after you have finished ; a screw-driver ; a light hard chisel ; a taper-piercer, to make holes in lead pipes ; some nails, string and wax tapers ; some slips of brown paper, which have been soaked in vinegar and saltpetre, for simple smoke-testing, such as waste-pipes, &c. There should also be some tin divisions, to contain two stoppered bottles, having a tablespoonful of diluted sulphuric acid in each, and about six 'torpedoes,' each charged with two ounces of oil of peppermint.

The lower part of the bag is a box, having a cover well secured and jointed with rubber, so that no scent can escape. This box should not be taken inside the house, and it should be fitted inside with tin divisions, to receive, say, two stoppered bottles, each to contain $\frac{1}{4}$ lb. of ether ; two bottles, each to contain 2 ozs. Hotchkiss's oil of peppermint ; two bottles, each to contain $\frac{1}{4}$ lb. of oil of turpentine (artificial almonds) ; a duster or two, and practice will perhaps suggest other tools, apparatus, and tests. With such a bag, fitted, you can commence operations ; and first I should advise you to make an inspection of the whole premises, and take a rough sketch of the basement floor, noting by a X every sink, by a ● every soil or waste pipe, by O every rain-water pipe, and by dotted lines the supposed position of drains, underground tanks, bench marks, cesspools, &c., and the more notes you take the better. Examine all upstairs apartments, making separate sketch of closets, bath-rooms, and lavatories, with notes of fittings, water supply pipes, overflows, &c. You will be now in a position to commence testing, as you will have a fair knowledge of the scheme of drainage. At the same time, if you can get a local mason and plumber who have had something to do with the drains, they can give you much out-of-sight information which you will find valuable.

Having studied the various directions of the drains and pipes, endeavour to inject into each section a test of different odour ; but, before commencing, all doors and windows must be closed, air-pipes and main drains stopped. Give your assistant full instructions, and keep him outside the house. He should be provided with the chemical box, several buckets of hot water, and a jug. Your position is inside the house, having previously provided yourself with what you require. Your assistant will drill the outside soil-pipe, or see that an outside sink is clear, and inject a test, which he washes down with hot water. If the test should be put in an outside soil-pipe, you can assist its development by pouring some hot water into the inside closet. Your next duty will be to enter each apartment, commencing near to where the test is applied, carefully closing each door after you ; and if any test is discovered escaping, endeavour to find its exact point of escape, and make a note. You may find it necessary to try inside soil-pipes, because there may be traps top and bottom, and this may be done by putting down the closet a 'torpedo,' suspended by about a yard of string.

To describe the mode of testing in every case would far exceed the limit of this paper, but, like everything else, to be successful requires experience and a large amount of ingenuity, for the difficulties are many, and not least is having inaccurate smelling powers ; and it is astonishing how defective the sense of smell is with some people. I have met with individuals who have failed to detect any scent even from oil of peppermint dropped into a glass of hot water, and again others who have scented out one's test-bag as it was taken through the house. A successful tester must, therefore, cultivate this important sense, so as to be able to distinguish the difference between one scent or another, and it is well to procure the use of any inmate's nose also, as it confirms your own opinion, and is evidence. A perfumer can tell to a nicety the kind of scent contained in a bottle or cake of soap, and their proportions, and I see no reason why drain-testers should not be able to distinguish the scent escaping into the house that his assistant has injected into the drain outside.

Another important matter in drain-testing is temperature. If the house to be tested be occupied and plenty of fires going, and the outside air at freezing point, the probability is that your testing will be very successful ; on the other hand, should your test be applied to an empty house, and the outside temperature warm, very leaky drains may not be detected ; in the latter case it is better to put off your testing till a more suitable day.

For chemical testing, Hotchkiss's oil of peppermint stands first on the list—dose, from one to two ounces—and it can be detected in the drain for twenty-four hours after it has been applied ; next, sulphurated ether—dose, four to six ounces—this passes off in about four hours, and care should be taken not to allow a light to come near the ether, or for it to accumulate in pockets.

I tested the drain of one house with ether, and a fortnight afterwards a workman opened a cesspool into which the test had found its way, and upon striking a light to examine the cesspool, he was blown about three feet into the air, and had some slight burns ; and a lady client once informed me that she had tested her own drains at night, by pouring into an outside sink a bottle of ether ; the

result was that she was thrown some distance from the seat of operation, and her servant, who had the candle, ran for her life, and some light woodwork near took fire.

Nitro-benzole is a powerful test and retains its smell about as long as peppermint; it has a strong almond scent—dose, six ounces. Oil of aniseed is about the same character as murbane, but it cannot be successfully used in cold weather. There are other tests, such as oil of thyme and eucalyptus; but I find the above are sufficient for my practice.

In chemical testing great care must be taken not to be deceived by a false scent. If your assistant passes through the house after opening a test-bottle he may leave a trail behind him, which may be mistaken for an escape from the drain. A lady amateur informed me that she had tested her drains, and found them in a dreadful state. She poured a bottle of peppermint into an inside water-closet, and she traced the scent up her staircase and into every room of the house. The test of course passed through the closet door into the warmer atmosphere of the house, and so deceived her. A test properly applied in this case discovered no defect whatever.

In the upper bag I have suggested bottles with a little sulphuric acid in them. These are for taking samples of water from the pump, tap, or underground rain-water tank; and although I do not advise the readers of this paper to turn amateur chemists, I think they should have sufficient knowledge to be able to tell the difference between good and bad water, or to test in a simple manner the water they may find in use in a house they are called upon to inspect. If you get a sample of fairly good water, and put it into a test-tube with a drop of permanganate of potash, it will colour it a very light pink, and it should remain this colour for a day at least; but if you treat a sample of foul water in a similar manner it will immediately assume a yellowish colour, showing that it is not pure; and if such water as this be found in a house, the sooner an analytical chemist's opinion upon it is taken the better.

DISINFECTION OF RAGS.—The Treasury Department of the United States has given the following directions for disinfecting rags imported into the United States from Egypt. They have been prepared after consultation with the Boards of Health of New York, Boston, and New Haven. 1. Boiling in water for two hours under a pressure of fifty pounds per square inch. 2. Boiling in water for four hours without pressure. 3. Subjection to the action of confined sulphurous-acid gas for six hours, burning one and-a-half to two pounds of roll brimstone in each 1,000 cubic feet of space, with rags well scattered upon racks.

DOMESTIC POISONS.—In a lecture recently delivered at the Health Exhibition, Mr. Henry Carr dealt with the dangers arising from the presence of arsenic in wall papers and domestic fabrics, to prevent which a Bill had been drafted, the provisions of which were not more stringent than those already in force in Germany, Sweden, and other countries. Owing to the investigations which had been made there had been already a great diminution in the use of arsenic colours, but the public needed to be reminded of the fact that green was not the only colour in which arsenic was to be feared. Several specimens of paper-hangings were exhibited in pairs representing arsenical and non-arsenical colours of very nearly the same shade. The two principal methods of testing for arsenic were next described in detail, and Reinsch's recommended for general use as being more easily carried out and sufficiently accurate for all practical purposes.

THE HOUSING OF THE POOR IN BIRMINGHAM AND THE BLACK COUNTRY.

(FROM OUR OWN CORRESPONDENT.)

[Sixth Article.]

THE newly-incorporated municipal borough of West Bromwich is one of the most pleasantly and healthily situated towns in the Black Country district. In some respects it has advantages which are not possessed by any other of the numerous parishes between Birmingham and Wolverhampton. Its altitude is high, it being in occupation of some of the highest table land in England. And although on the west and north it is subject to noisome fumes from chemical works and the black sulphurous clouds which belch from the throats of numberless forge and foundry chimneys, together with the choice atmosphere wafted from a couple of extensive gas-works, on the east the eye wanders over many a mile of pasture and woodland only limited in one direction by hills which bound the horizon, and in the other extending on the one hand to the metropolis of the Midlands, and on the other to the borough of Walsall. Over this wide expanse the population is very sparse; factories, foundries, and forges are unknown, and the atmosphere is as clear and pure as the landscape is full of natural beauty. Nothing more astonishes a stranger to the locality than to emerge from the lower parts of the town and behold stretched before him so extensive and beautiful a vision. Upon the slope of the town overlooking this scene lies a park of fifty-six acres, given to the inhabitants by the Earl of Dartmouth, the Lord of Sandwell, of which estate it previously formed a part. In respect to the advantages we have herein mentioned, the inhabitants of West Bromwich are in a position to be envied by the many thousands of their less fortunately situated neighbours. West Bromwich is also fortunate in its High Street—one of the finest in England—and in its public buildings, all of which are ornaments to the town. It is not so fortunate in its sanitary administration, and however well its claims to be a prosperous and progressive town may be maintained in its commercial and general municipal relations, the claim to distinction fails when submitted to the test of sanitary science and sanitary advancement. Like most of the other towns in the district, it has been aroused to a sense of its shortcomings in matters appertaining to sewage disposal and purification through fear of the Rivers Pollution Prevention Act of 1876, with the penal enactments of which it has been threatened by its big neighbour Birmingham, on account of its pollution of the river Tame. Like most of the other towns in the district, also, it has turned its attention to the remedying of this evil, and has in hand a drainage and sewage purification scheme, which may, or may not, be in operation at the end of six or seven years. Like the other towns in the district, it has suffered from epidemic incursions of infectious diseases, and at the present time is under the sway of an outbreak of smallpox, which has maintained a more or less strong hold upon the place for more than a year and a half. All the neighbouring towns—Tipton, Darlaston, and Wednesbury especially—have been subjected to this dread scourge, and West Bromwich was about the last town in the district which succumbed. For some months it was

very virulent, and taxed the utmost resources of the place. When it first broke out here there were no means of isolation, and it was only after some months' delay, and by dint of strong pressure from without, that the sanitary department of the Corporation made such efforts to grapple with the disease as were likely to prove effectual. They hired a temporary building to serve the purpose of an isolated hospital; and took measures for carrying out long-delayed plans for the erection of a permanent hospital. After a while the disease began to flag, but it has never been thoroughly stamped out, and during the last few weeks has broken out again almost as badly as ever. It would not be wise, it might not even be correct, to say this was the result of any shortcoming on the part of the sanitary department. But there seems to be a generally felt and a frequently expressed conviction in the minds of the inhabitants that the work of that department is not so vigorously and effectually carried on as it might be, and that there is too apparent an inclination to underestimate the danger and neglect or dally with precautions.

West Bromwich is a municipal borough, with a population of about 60,000, situate between four and five miles from Birmingham, and between seven and eight from Wolverhampton. It covers an area of 5,710 acres, and its population is lodged in about 10,850 houses, giving a proportion of about five and a half persons to each house. In too many cases, however, especially in the small insanitary dwellings which are huddled together in the poorer and more thickly populated part of the town, it is no uncommon thing to find nine or ten persons in occupation of a three-roomed cottage. In respect to overcrowding, however, the town is in a much better position than its neighbours. The industries of the place include coal mines, iron foundries, hollow ware, and spring balance manufactories, nut and bolt works, &c. The water supply is derived from wells, and the mains of the South Staffordshire Waterworks Company. The latter is reliable; the former is generally otherwise. There is no system of drainage for sewage. The storm water and swill water from the houses runs along the street channels—where there are any—and is carried with the detritus from the roads into the watercourses and the canal. The open midden system—one of the most filthy and unwholesome systems of dealing with animal excreta in existence—prevails in all but the newest and better class houses, where the middens are covered and fitted with a ventilating shaft. There is probably no part of the district where more glaring instances of sanitary neglect and filthiness can be found, combined with inadequate closet accommodation and an absence of the requirements of decency and cleanliness. The regulation allowance of closets in all the more thickly-populated parts of the borough is one to three houses; in some places there is but one to four or even five. They are generally placed side by side, sometimes within a few feet of and facing the house door, occasionally a hundred yards or more away. Many of them have no doors, or had not until very recently, when an independent inspection of the borough with publication of the results directed particular attention to what in some cases was no less than a public scandal. The middens and ashpits, generally combined, were found so full in dozens of cases that the liquid sewage was forced up through the bricks or flooring of closets, and lay in shallow pools on the surface or

trickled away down the yards, while the ashes and house refuse, overflowing from the inadequate or ruinous receptacle, formed a festering stinking heap in the open yard. It is no uncommon thing in some parts of the borough to see an open midden or cesspool standing in an exposed position in a yard, in some instances contiguous to a street, protected only by a few inches of brick wall. In one yard especially there is a green, stagnant pool, some feet in width, actually below the surface of the ground, unfenced and unprotected in any way from the children of all ages playing in the immediate vicinity. When a heavy shower of rain stirs up these fetid pools, especially after the contents have been accumulating for some length of time, the stench is something to be avoided. The removal of all this filth is carried on by nightmen, and every particle of it has in many cases to be taken through the house.

A few instances, taken from actual observation, will show the statements above made are not in any way overdrawn. The borough is divided into six wards. Greets Green Ward, which is on the lowest level, is one of the most insanitary. In one court opening into the main road are fourteen houses, containing between sixty and seventy persons, for the use of whom there are four small privies, with one open midden. In another court close by, the houses are arranged in the shape of the letter T. The privies allotted to these houses were some of them without doors, and the middens were in a very imperfect condition. In one street twenty-one houses open into one unpaved yard, in which are six closets. At the time of the inspection above referred to, the middens and ashpits were so full that the liquid oozed up through the brick floors of the closets, and a great heap of ashes and house refuse had formed in the yard, where it had been accumulating for some weeks. In another street are two courts, the occupants of which were entirely without water for dietetic purposes, and had to rely upon rain water, which, even when properly filtered, is most unpleasant in flavour, owing to the smoke and fumes through which it has to pass. At the junction of two thoroughfares in this neighbourhood, the inhabitants of a row of twelve houses deposited their ashes and other house refuse, forming a heap neither agreeable to sight or smell. In another place, forming a thoroughfare between two main roads, much of the faecal matter seemed to be deposited on the surface of the ground, while a couple of cartloads of house refuse occupied a conspicuous position, and appeared to form a kind of playground for the children.

Abutting on the Greets Green Road—a main thoroughfare—were three cottages in process of demolition, the remnants of a row. Two of them were tenanted. More miserable tenements could scarcely be imagined, and yet a man and his daughter, employed at neighbouring brickworks, had lived in one or other of the row for forty years, paying half-a-crown a week rent. About fifty yards away were the remains of a closet, utterly unusable, and the functions of nature had to be discharged in the open. There were no back doors, nor any water-supply. One would think even the most supine of sanitary authorities would have had no difficulty in declaring such hovels unfit for habitation. A row of seven houses facing to the Greets Green Road, and opposite large ironworks, also have no backways. Their sanitary offices comprise two closets at one end of the row, reached direct from the public footpath,

from which they are shut off by a latched gate only. Fæcal matter lies about the few square feet of space allotted to the occupants of these seven tenements. In another part of the same thoroughfare is a row of twelve houses, containing in all a population of some sixty persons, for whose use there were nominally three closets, all exposed to public view. Practically, however, the sanitary accommodation was restricted to two of these offices, one of them being without a door, within full view of a much frequented footpath and the towing-path of a canal, and also habitually used by the men and boys employed at some adjoining ironworks, a 'short cut' to which lies in immediate proximity to it. How can habits of cleanliness and decency, or even morality, be expected to be maintained under such circumstances? On the opposite side of the road is another row of ten houses, none of which have any back doors. The closets for the use of the people living here are situate nearly 110 yards from the end house, and can only be reached along the main road. There are four of them, two being without doors, and all within view of passers-by. The fæcal matter runs away into a gully, where it stagnates or percolates into the ground. In another part of the same ward the liquid filth from the middens runs down the yard to a convenient spot at the back of a row of houses, where it forms a green, stagnant, stinking pool, percolating through the bricks and into the foundations of the houses, with results not pleasant to imagine. A large number of the houses in this and other wards in the borough are in bad repair, unspouted, damp, and internally filthy dirty. The landlords will not do anything to them, or even find the materials where the tenants are willing to apply them. The tenants cannot afford to white-wash and colour or paper the walls and ceilings at their own expense, neither can they remove to other quarters on account of being, very many of them, in arrear with the rent, and knowing that to attempt to 'flit' would be to run the risk of losing the few sticks of furniture they possess. Of course a great deal of the dirt and squalor and general wretchedness is owing to the uncleanly and intemperate habits of the people themselves, and in some cases to their fondness for live stock, pigeons and poultry of various descriptions being kept in close proximity to the houses, often in the houses themselves; it being no uncommon thing to find the only cupboard in the living room occupied at the bottom with coals, and above as a pigeon cot. In many cases, too, the landlords find their houses wilfully pulled to pieces, the quarries being torn up from the floor, and the woodwork from any place available, and used for various purposes. And as in some of the worst places they can neither get rent or get rid of the people without resorting to harsh measures, it cannot be wondered at that there should be a want of eagerness on their part to spend money on property possessed under such unprofitable conditions. A case in point occurred only a week or two since. A labouring man who, by dint of industry and thrift, had become possessed of several small houses in the central part of the borough, had them painted and done up, inside and out. Shortly afterwards four of them were tenanted by Irish people, and in a few days from that they became so infested with vermin that he had to expend several shillings on sulphur and carbolic soap, after getting rid of the objectionable tenants, before he could make them fit for anyone else to inhabit. Still, a great deal could

be done at comparatively slight cost by both landlords and the sanitary authority to remedy the more glaring evils. Great drawbacks to cleanliness and healthiness are the unsatisfactory state of the surface drainage, the damp condition of the houses owing to want of spouting and the existence of water in the cellars, the dilapidation and foulness which characterises so many of the privies and middens, and the want of a supply of pure water. We could multiply such cases of bad drainage and insanitariness as we have mentioned above by the dozen, did space permit. We have simply selected a few at random, and from one ward only, as showing the condition of things existing in a borough which claims—and with reason in some respects—to be in advance of many of the towns in the Black Country. In the more central parts of the borough, where the population is very dense indeed, the unwholesome conditions under which the people live are necessarily much aggravated. Little need for wonder is there that when a disease such as smallpox or scarlet fever breaks out, it spreads with alarming rapidity, and is very difficult to get rid of. It is some little satisfaction to find that the authorities are awaking to a sense of the responsibilities resting upon them, and that the work of the sanitary department is likely to be carried out in a more prompt, active manner in the future. One thing is absolutely necessary if any effectual improvement is to be made, and this is the increase of the departmental staff. Under such a condition of things as we have indicated, it will be readily understood to be absolutely impossible for one sanitary inspector to properly supervise a borough like West Bromwich. And yet up to the present time, there is but one such official. One cannot wonder that infected houses should remain in a neglected condition, and become centres of contagion for want of proper disinfection and cleansing, or that general and easily preventable insanitariness prevails to so large an extent.

THE BIRMINGHAM TOWN COUNCIL AND ARTISANS' DWELLINGS.

The report and recommendations of the Artisans' Dwellings Inquiry Committee—a summary of which was given in the *SANITARY RECORD* for June 16 formed the subject of a lengthy debate at a special meeting of the Birmingham Town Council held on the 24th ult. The mayor, in moving the adoption of the report, remarked that with regard to the sanitary condition of the houses, many had been cleaned and repaired to a considerable extent. The great difficulty in connection with the small houses in the future was that those rented at 2s. 6d. and 3s. 6d. per week were occupied by persons most of whom were not getting more than 1l. a week, and a consequence of condemning those houses would be to drive many of the people into the workhouse or to lodging-houses, and the remedy in that case would be worse than the disease. Many of the owners of this small property, too, were in as impoverished a state as the occupants, and to attempt to close their houses without giving them compensation would be exceedingly harsh. The difficulty was not in regard to the erection of new houses, for the building by-laws would prevent the erection on the same soil of defective property in the future; but in regard to the property put up before there were any such regulations. They were assured on all hands that the working classes were willing to pay

for a good house as much as 5s. to 6s. per week, and good houses ought to be provided at that rent.

Considerable discussion of a somewhat animated character followed, the report being ultimately approved, with the exception of the recommendations as to cleansing the courts and providing closet accommodation, which were referred to the Health Committee, with instructions to report their views thereon. The Improvement Committee are also directed to inquire how the principle of rent collection, as devised and carried out by Miss Octavia Hill in London, can be applied to the area under their control. The recommendations appended by the Artisans' Dwellings Committee to their reports have been somewhat adversely criticised, as but a lukewarm and half-hearted dealing with the question. They certainly do partake somewhat of the character of 'grandmotherly legislation.' There could be no doubt in the minds of any one who followed the evidence given during the inquiry that the generality of the courts were in a dirty if not an absolutely insanitary condition. Yet it is only suggested that the 'worst' courts shall be 'occasionally' cleansed by public scavengers. Such courts as exist in Birmingham, having many of them a large resident population, should be regarded as thoroughfares and submitted to the same treatment. They require it, as a rule, more than many streets and open thoroughfares. Undoubtedly there ought to be no qualification in so important a matter; whatever is done or left undone, every court in the borough ought to be lighted and regularly and thoroughly cleansed.

In addition to the physical and sanitary advantages, the moral effect upon the residents would not fail to be beneficial. People with cleanly habits find it difficult to practise and maintain them in the midst of filth; those who have not such habits will never acquire them under the conditions which too often surround them. The necessity for the recommendation as to handrails to staircases being rigidly carried out has been shown very recently by the death of a man through falling over a staircase without a rail, during a drunken spree on the night of his marriage. On the whole it cannot be said that the result of exhaustive inquiry has been the solution of that difficult social problem—What to do with the poor. The committee seem rather to have been content to shift much of their responsibility on to other shoulders, and the poor have to some extent to suffer for the municipal extravagance of the past, which prevents the Corporation, by reason of the emptiness of its coffers through 'daring enterprises, carried out with the most dazzling splendour,' from adopting practical and thorough reform.

We have now endeavoured, though in but a cursory and imperfect manner, to describe the conditions under which the poorer classes of Birmingham, Wolverhampton, and other populous parts of the Black Country district, live, move, and have their being. The sanitary and social conditions are alike deplorable, and one is often the result of the other. One cannot wonder much at drunkenness, cock-fighting, dog-fighting, and even prize-fighting being indulged in as often as possible, where so large a degree of brutality and ignorance and vice in its most ferocious form exists. Nor can these be swept away by all the moral and suasive influences brought to bear, until the dwellings of the masses and their surroundings are less filthy and less hostile to all notions of cleanliness, decency,

and morality. The home has no attraction; the man seeks attraction elsewhere. The conditions under which he is compelled to live will often not admit of the cultivation of self-respect, unless it be inherent in him, and many people soon cease to trouble about keeping the house clean and tidy, where everything around them is suggestive of all manner of filth and nastiness. A great responsibility rests upon local authorities in this matter alone. Let them set the example of cleanliness and decency in regard to the dwellings and their surroundings. The occupants, however poor, will soon follow it, and the moral, as well as the physical and sanitary well-being of the people will be considerably enhanced.

SANITARY BUILDING LAWS IN NEW YORK.*

By CHARLES F. WINGATE, Sanitary Engineer.

UNDER its English charter New York possesses almost no sanitary powers, and prior to the Revolution there seems to have been no sanitary legislation worth mentioning in the whole State. Even down to 1804, all legislation affecting the public health, which related mostly to quarantine and the removal of nuisances, was limited in its application to the cities of New York, Hudson, and Albany, the only ones of note at that time in the State.

In 1820, an elaborate Act of forty-five sections provided for a Board of Health for the three cities just named, and the navigable waters connecting them. It included a provision for Health Wardens to inspect dwellings and other buildings. After the cholera epidemic of 1832, local health boards were formed throughout the State. At about 1850 the Common Councils of New York and Brooklyn were each constituted Boards of Health, with the result of so mixing up politics with health administration that in 1873 a change was made, and the present Board of Health was created. The powers of the present Board of Health, as regards buildings in New York, are thus set forth in the Sanitary Code:—

The first provision, sect. 17, is sufficiently comprehensive:—'No person shall hereafter erect, or cause to be erected, or converted to a new purpose by alteration, any building or structure which, or any part of which, shall be inadequate or defective in respect to strength, ventilation, light, sewerage, or of any other usual, proper, or necessary provision or precaution, nor shall the builder, lessee, tenant, or occupant of any such, or of any other building or structure (within the right or ability of either to remedy or prevent the same), cause or allow any matter or thing to be done in or about any such building or structure dangerous or prejudicial to life or health.'

Sects. 18 and 19 repeat much of the above, and add that no cellars or any apartment not at least two feet above the level of the sidewalk are to be used for sleeping purposes, or as a place of residence, nor any apartment where the floor is damp, or which is impregnated with unwholesome odours. Overcrowding is forbidden. 'Adequate privies or water-closets' must be provided and kept in a cleanly condition. Rooms shall be 'adequately lighted and ventilated.'

* Abridged from the *Medico-Legal Journal*. New York.

Later provisions (Sects. 190-93), adopted 1877, required that in hotels, lodging, and tenement houses proper traps shall be provided under all plumbing fixtures, and insist on the ventilation of privy vaults and the extension of soil-pipes through and above the roof of every dwelling.

Sect. 201, adopted 1879, requires a permit for lodging-houses. In short, the powers of the health authorities, so far as the law is concerned, are absolute, and justified the saying that the Shah of Persia intended to establish a similar board in his dominions, in order to increase his power over his subjects. 'Its control over nuisances,' says Dr. Stephen Smith, 'extends from the suppression of a crowing cock, which disturbs the morning slumbers of the sick, to the removal of the gigantic corporation of butchers, numbering 250 establishments.'

But many of the provisions of the Code are vague and too general. The language is not specific, and leaves it to be disputed as to what is 'adequate ventilation and light,' and as to what are unwholesome odours and exhalations. If strictly enforced to the letter the Sanitary Code would revolutionise the metropolis, but it would be impracticable to do this and also impolitic. The Tenement House Act of 1867 was the first law passed directly relating to sanitary building in New York City. Its main provisions were:—

1. The requiring in every interior sleeping-room of two ventilating or transom windows, each having an area of three square feet, and communicating either with a hall or with a room opening on the external air.
2. A suitable ventilator on the roof over the hall stairway.
3. Fire escapes to be provided.
4. A water-closet or privy for every twenty occupants, and connected with the street sewer when such exists.
5. Cellars not to be used as dwellings without a special permit.
6. Garbage to be removed, and tenements to be kept clean and whitewashed twice a year.
7. Owners' and agents' names to be posted on the front of the building.

This has been a dead letter. These provisions enabled the health authorities to effect many reforms; but they were lacking in several particulars, afterwards supplied in subsequent amendments.

In the autumn of 1876 general attention was drawn to the evils of the New York tenement house system by several circumstances. Special investigations had been made by two leading charitable associations in the city into the condition of this class of buildings, and important facts relative to their defects made public in reports and through the press. In December of the same year the sanitary engineer offered 500 dollars in premiums for the best designs for a model tenement house on an ordinary city lot, 25 x 100. In response to this competition 206 designs were sent in by architects from all over the country, and were exhibited. While the plans selected for approval came nearest to fulfilling the terms of the competition, the committee emphatically declared that in their view it was impossible to secure the requirements of physical and moral health within the narrow and arbitrary limits of the ordinary city lot; they, therefore, recommended further agitation to secure needed legislation, regulating the number of occupants, the amount of open space, the provisions for light, ventilation, and cleanliness on sound sanitary principles.

Simultaneously with this announcement a mass meeting was held, at which a committee of nine was nominated to suggest measures for reforming

the tenements. Messrs. D. Willis James, W. Bayard Cutting, W. W. Astor, Cornelius Vanderbilt, R. T. Auchmuty, James Gallatin, Henry E. Pellet, F. D. Tappen, and C. P. Daly, who composed this committee, immediately proceeded to take steps toward the formation of a joint stock corporation for the erection of a block of model houses for working men; and also drafted a Bill (with the aid of Judge Charles P. Daly and of Professor Chandler) amending the existing Tenement House Act, which passed the Legislature in May. A very desirable clause, imposing a licence on all tenement houses, was unfortunately struck out, and a clause inserted instead appropriating 10,000 dollars to aid in enforcing the law.

The Tenement House Act of 1867 did not prevent a building covering the whole lot. This was remedied by requiring a clear open space, of not less than ten feet, between the building and the rear line of the lot, and by authorising the Board of Health to restrict the proportion of lot to be covered to 65 per cent., whenever they deemed it advisable, except in the case of corner lots.

The amended Act requires that every sleeping-room 'shall have at least one window, with a movable sash, having an opening of not less than twelve square feet, admitting light and air directly from the public street or yard of the said house, unless sufficient light and ventilation shall be otherwise provided, in a manner and on a plan approved by the Board of Health.' The Board are now approving plans where the inside rooms open upon shafts of the following dimensions: For houses not more than three storeys in height, twelve square feet; not more than four storeys, sixteen square feet; not more than five storeys, twenty square feet.

Nothing was said about overcrowding. The Board are now authorised to require an owner to reduce the number of occupants of any tenement house that they consider to be overcrowded, until a minimum of 600 cubic feet of air space is secured to each tenant. The amended law also permits the Board of Health to require the presence of a responsible person, either the owner or a janitor or house-keeper, in every tenement house occupied by more than ten families. For a number of years the Board of Health had been very much assisted in their work by the co-operation of the sanitary company of police. In 1876 they were deprived of their services, and the committee found that the department was much crippled in its usefulness thereby. A provision was incorporated into the new law, which has secured to the Board the services of thirty policemen.

On March 12, 1883, a law was passed by the State Legislature prohibiting the making of cigars in tenement houses after Oct. 1. The chief objections to the tenement-house cigar-factories are that they are a sanitary nuisance, detrimental to education and an illegitimate interference with a legitimate trade. The mortality among children is excessive, as it must be when children, from six years of age upward, spend most of their time stripping tobacco and bunch-making. The school laws cannot be enforced, and the parents receive such low wages that they are compelled to make their children work. These places are also physically demoralising, owing to bad ventilation, long hours of labour, the night and Sunday work, and eating food that is impregnated with tobacco. There are from 18,000 to 20,000 persons engaged in cigar-making in the

d factories in New York, and there are 100 manufacturers. The tenement-house workers number 28, and they employ from 3,750 persons. The hours of labour in the are from 50 to 57 per week. In the tenements they vary from 70 to 100 hours per week. The workers get from 1½ dols. to 2 dols. and less than is paid in the factories. In their long hours they can make cigars in they are consumed, and that is why so far-makers are out of work in this city. Physicians have strongly condemned this. They say that bronchial catarrh, pneumonia, inflammation of the lungs, and various nervous diseases are engendered in houses where such a crowded life is carried on.

A prohibition may be necessary in time with the manufacture of clothing in tenement houses, under special restrictions, owing to the contagious disease being conveyed by them to the public at large.

Following winter the same public-spirited man who had obtained the amendments to the Tenement House Act secured the adoption of an amendment requiring that the plans of the plumbing and drainage of all new buildings must be submitted to the Board of Health for approval, and that they shall be executed in conformity to the same and subject to official inspection. It was ordered that all plumbers should be registered and licensed. The value of this measure is demonstrated almost daily, and the fact that similar provisions are being adopted by other cities in the country, and are recommended for adoption, is the best proof of its merits. It prevents, that all plumbing in new buildings should be executed according to certain rules; these have been drawn up in consultation with engineers, and sanitarians of the highest standing, and hence represent the best thought and the best of our time in this line of work. They insist on the use of good material and workmanship, making work accessible and as far as possible new, thorough ventilation and perfect fixtures, disconnection of all house drains from sewer or cesspool, separation of the water supply from any source of pollution, abundance, isolation of fixtures from living rooms, and, finally, suitable tests when the work is done to see that the plumbing is safe. As a result we find that all the new houses plumbed since the law went into operation are free from defects common to the mass of other dwellings, and which have seriously affected the health of their occupants. The most ardent opponents of the law have ceased to make complaints against it. The manner of its enforcement is a credit to the health authorities, while the success is due to Messrs. Gallatin, Meyer, and Lindler, who secured the passage of the law. In the first eight months of 1882, dwellings to the value of 34½ million dollars were erected in the city. What is now needed is to extend the scope of this law so as to include alterations in old buildings as well as new ones, more especially large jobs of work costing over 100 dollars. Registration of plumbers should also be supplemented by a formal examination before a competent authority of each applicant for registration, so that they may be able to distinguish between competent and incompetent workmen. At present the registration is a mere form, and all applicants stand on the

same footing. If, however, they had to prove their qualifications by such an examination as I have suggested, the best plumbers would receive the credit they deserve, and the ignoramuses would have to be content to wait longer for a certificate or receive one of a second grade.

Within a few years the attention of the public has been drawn to the very high buildings, mostly for offices or apartment houses, being constructed in all parts of the city, and their effect upon the health and safety of their inmates and persons living near by. This is a subject which calls for immediate attention, and a committee of leading citizens are now considering what restrictions should be placed on the height of such buildings. The chief objections to the lofty buildings now coming into vogue is that they darken the streets and exclude sunlight from neighbouring windows. The right to light and air has been established by innumerable lawsuits in England, and is not to be disputed. By general consent, the property adjoining a huge French flat is lessened one-fifth or more in value by the erection of the latter. The adjacent streets and yards are made permanently damp, lower rooms become uninhabitable, neighbouring chimneys and soil-pipes have to be raised to be of any service, the wind sweeps through the narrow streets with gusty violence, causing discomfort and sore throats; lastly, tall buildings invite fire and threaten the safety of their inmates; they also disfigure the appearance of the city, and may spoil a whole neighbourhood, as they are rarely tastefully designed. An example of this is seen on Fifty-seventh Street, which contains some of the finest residences in the city, whose architectural appearance is wholly destroyed by several huge structures built in the plainest and cheapest manner, which inevitably seize the visitor's eye and mar all their exquisite surroundings. It is quite time a stop was put to this practice, and that all buildings, or, at least, dwelling-houses, should be limited in their height as in Paris, proportionate to the width of the street, avenue, or open space in front.

FEVER FROM WANT OF WATER.—At the last meeting of the Hexham Rural Sanitary Authority, Dr. MacLagan, Medical Officer of Health, stated that several fresh cases of typhoid fever had broken out at Eltringham; in his opinion the outbreak of the disease was entirely caused by deficiency of water. The Inspector reported that he had supplied disinfectants to eleven fever-infected houses in the small village of Eltringham.

PUBLIC BATHS AND WASHHOUSES.—At a meeting of the parishioners of St. Bride, Fleet Street, held in the vestry of the church, under the presidency of the vicar, the Rev. E. C. Hawkins, M.A., the question of the erection of public baths and washhouses for the parish was brought under consideration. Mr. J. Lewis moved a resolution affirming the necessity for some such provision, and suggesting as a site the disused burial-ground near the Farringdon Street fruit market. He said the parish had in hand the sum of 3,000*l.* in the shape of an accumulated fund from parochial property, and he thought the money could not be better used than in providing an establishment of cleanliness and health. The vicar, in putting the resolution from the chair, expressed his warm approval of the project, and said that the money derived from parish property would be far better spent in establishing an institution for the public good than in distributing it in doles to a few individuals, the inevitable tendency of which was to reduce wages and raise rents. The resolution was adopted unanimously.

THE REGISTRAR-GENERAL'S ANNUAL REPORT.

By J. HAMPDEN SHOVELLER.

THE Forty-fifth Annual Report of the Registrar-General of England has been recently issued. It contains detailed abstracts of the marriages, births, and deaths registered in England and Wales during the year 1882, prefaced by a valuable and interesting analysis of the vital statistics of that year.

The growth of the population of England and Wales during 1882, occasioned by the excess of births over deaths, was 372,360; but this does not represent the real increase. Emigration and immigration have to be taken into account. The population of this country in the middle of 1882 is estimated at 26,413,861, an increase over that of the preceding year of 352,125, a number more than 20,000 less than the balance between the births and deaths of the year. In consequence of the unprecedentedly large numbers of emigrants during the past few years, the loss of population due to the large excess of emigration over immigration must recently have been considerable.

The marriages during 1882 numbered 204,405, equal to a rate of 15.5 persons married to each 1,000 persons living. It is satisfactory to note that the marriage-rate, which fell year by year from 1873 to 1879, has since steadily recovered. Of the marriages during 1882, nearly 72 per cent. were solemnised according to the rites of the Church of England. The marriages included those of 124 persons described as divorced. In no less than 15 per cent. of the marriages the officiating minister neglected to insert in the register the name of both parties, or of one or other of them. The mean age at marriage among those whose ages were duly stated was 27.9 for males and 25.6 for females. The educational test supplied by the signing of the marriage register with a mark instead of the person's name shows a progressive improvement, though it has not, during the last few years, been so rapid. The proportion of persons who were unable to sign their names was 15.2 per cent. in 1882, which was a smaller proportion than in any previous year; still the fact remains that even now 13.2 per cent. of the men and 17.1 per cent. of the women of England are unable to sign their names in writing; though in the year 1850 no less than 31 in each 100 men and 46 in each 100 women who married were unable to sign the marriage register.

The total number of births registered in England and Wales during the year 1882 was 889,014, equal to a rate of 33.7 per 1,000 persons estimated to be living. This was the lowest birth-rate recorded since 1853, and was considerably below the average rate in the preceding ten years. Of the 889,014 births, 452,752 were males and 436,262 females, so that to each 100 females 103.8 males were born. The proportion of illegitimate births was fewer in proportion to the population than in any previous year; though, in consequence of the diminution of the legitimate births, resulting from the decline in the marriage-rate, the proportion of illegitimate to total births did not show any decline.

The deaths registered in 1882 were 516,654, and were equal to a rate of 19.6 per 1,000 persons living. With the single exception of 1881, when the death-rate was 18.9, the death-rate in 1882 was the lowest on record. During the ten years 1871-80 the rate

averaged 21.4, and had the death-rate in 1882 corresponded with this average, no less than 48,338 more deaths would have been registered. This improvement in the general health of the country appears to have been shared in by persons at each age-period during each of the two years 1881 and 1882, so that the conditions prevailing in those years must have been favourable to health in all stages of life. The rate of mortality among infants showed the usual excess in the manufacturing and mining counties, and was lowest in the agricultural counties.

In the urban population of England and Wales, consisting of about fifteen millions of persons, the death-rate during the year under review was 21.1, while it did not exceed 17.2 in the rural population of about ten and a half millions. Both these rates showed a marked decline from the average rates in preceding years.

The number of names added to the alphabetical indexes of marriages, births, and deaths in England and Wales during 1882 was 1,814,478. These records, for the convenience of public reference, extend from the year 1837, when civil registration was first established, to the present time, and contain an aggregate number of 66,619,275 names. The number of searches in these records during 1882 was as many as 33,597.

POISONOUS DYES.—The danger of wearing next the skin articles of clothing dyed with substances obtained from benzol and other products of coal tar has been fully recognised by medical men, who have given instances of the ill-effects caused through the absorption by the skin of these irritating and poisonous compounds. Their warnings are repeated and illustrated in a case of exhibits sent to the Health Exhibition by an authority on skin diseases, Mr. James Startin, M.R.C.S. In this case, which will be found in the Dress Section in the East Quadrant, near the entrance from the conservatory, are specimens of some of the beautiful aniline colours—rosaline, magenta, violet red, methyl violet, Bismarck violet, &c.—and gloves and stockings dyed with the substances by which these hues are obtained that, in cases coming under the treatment of the exhibitor, had produced eruptions on the skin of women and children, in some instances of a very severe character. Below are shown many vegetable dye stuffs, and gloves, stockings, and other portions of dress dyed with them, from which no danger of the kind need be apprehended.

VEGETARIANS are taking up the feeding of the children of the poor on a self-supporting basis. A correspondent describes the experiment in the *Daily News*. A room which had a small fireplace with hobs was taken in King's Cross court at 3s. a week; three saucepans and other cheap utensils were bought; two or three mothers were asked in to help and to learn to cook; a shilling was invested in lentils and vegetables, and 6d. in two wheat meal loaves. So the dinner was made by the teacher and the mothers, and eaten with relish by the mothers and some fifteen to eighteen children for a week. So far the dinners were free. The mothers were then asked to club together; they were to take the cooking in turn, day by day; one fire was enough; and the cost had been found to vary from 8d. to 1s. for twelve to eighteen portions of little more than a large breakfast cup each. According to the women are now cooking daily at their own expense the two-gallon saucepan full either of strong lentil soup, peas pudding, or sweet porridge. They feed their own children—each woman has three or four—and they have some left, which others in the court buy at three ladles for a penny. One day they fed their party for a shilling and sold the remainder to a non-co-operator for 2½d.; as 'the soup is beautiful.'

ADULTERATIONS IN THE UNITED STATES, AND HOW THEY ARE MET.

AMERICAN PLUMBING LAWS ARE CARRIED OUT.

(FROM OUR AMERICAN CORRESPONDENT.)

the States, so far as I know, which pretend to at all on this subject, the power to enforce is placed in the hands of the boards of The United States Legislature, or the State make the laws; and it is the duty of the health boards in the various cities to see they are properly carried out.

New York law went into effect three years ago. The State Board of Health, as soon as possible, began to prosecute certain dealers in groceries for violating provisions in and this was merely the beginning of an campaign against injurious and dishonest goods.

Let me give a fair idea of how these laws are enforced, summarise here, very briefly, some of the actions and prosecutions carried on by the New York Board of Health. Teas were found adulterated with mineral substances, and were, therefore, condemned under the section of the State Law which prohibits their sale 'if coloured, or coated, or powdered, whereby damage is done, or made to appear better than they really are of greater value.' Such action in a community of the importance of New York is of great moment, and it arrests all unsound goods, as soon as they reach this country, and they are scattered through the southern and northern States, where laws are less strict, and where, therefore, the harm done by such goods would go unchecked. Teas I speak of especially when they are shipped to America by English agents and palmed off on our unsuspecting poor, who are captivated by the low price at which they

are sold. Have any practical results followed these actions in New York? The continuation of many more, I think, answer this question satisfactorily.

Over a thousand packages of Pingsuey teas were seized by the Custom House officials, and under this 270 additional packages were seized and shipped to London. These were intended for export to the coal regions of Pennsylvania. In the first ten months after the passage of the New York law, the port of New York rejected 3,000 lbs. of drugs, and to present date has rejected over 900,000 lbs. of adulterated drugs and medicines.

Does of wheaten flour and bread were found adulterated with alum, which, when mixed with partially decomposed bread, makes it look stale.

Vinegars were found to be of an inferior quality but free from harmful adulterations. Spices were largely mixed with other substances, though serious adulterations have been discovered.

Candy is especially out of favour with the public as is no more than natural when it is found that chromate of lead is an important constituent. In medicines, quinine pills are found to be below the standard fixed by the law. Dealers in these articles are being tried to-day for violating the law of the land; and importers are

being punished by having their goods sent back to the shipping point.

In some of the States special legislation has been accomplished concerning the adulteration of milk. The Rhode Island law prohibits the sale, or the exchanging, of adulterated milk. All milk must contain 2½ per cent. of milk fats, unless the dealer is willing to mark distinctly upon each can the words *skimmed milk*: such milk is only to be sold out of a can so marked. If milk be shown upon analysis to contain more than 88 per cent. of watery fluids, or to contain less than 12 per cent. of milk solids, it is to be considered adulterated. A first conviction under this law results in a fine of 20 dollars, and, for every subsequent conviction, a fine of 20 dollars is imposed, with imprisonment for ten days.

Acting under the New York law, experts made a thorough examination of the dairy products of that State, and the adjoining commonwealths of Connecticut and New Jersey. It was found that the poorest milk sold was taken from the healthiest cows—milk which contained only 2·5 per cent. of solids and 88·5 per cent. of watery fluids. Skimming was considered to be very generally followed, houses having been erected for that special purpose. These experts discovered that butter was commonly adulterated with oleomargarine, lard, and cotton-seed oil; and, although these are not necessarily harmful, they have been condemned as fraudulent, as their specific gravity is lower than that of pure butter. In 1881, 800,000 lbs. of 'lard cheese' were manufactured in New York and sold for genuine cheese, which it closely resembles.

In Massachusetts the State Board of Health is vigorously prosecuting milk adulterators. The wholesale druggists have also suffered at the hands of this Board for selling drugs with a lower standard than that fixed by the 'Pharmacopœia.' Several firms were lately prosecuted in court, and escaped only by some legal technicalities. Let us hope, however, that they were sufficiently scared not to attempt fraudulent processes a second time. The New Jersey Board is likewise engaged, and has its analysts busily at work testing samples of food, milk, and drugs. Probably the laws against the adulterations of liquors are those least regarded in the United States. The following substances are condemned:—Cocculus indicus, vitriol, grains of paradise, opium, alum, capsicum, copperas, laurel water, logwood, Brazil wood, cochineal, sugar of lead, and other substances 'not necessary ingredients in the manufacture thereof.' The punishment is heavy, yet we rarely hear of its being carried out, and seldom read of prosecutions under this law. One or more of these injurious substances enter more or less into almost all of our liquors.

The inspectors of meats point out the danger arising from decomposition, and the consequent presence of trichinae and other parasites. Our housewives know, however, that thorough cooking is the remedy for this evil, and that meat subjected to a temperature of 160° may be eaten with perfect safety. It must be confessed that the system of meat inspection in our large cities is unsatisfactory, as it provides for the examination of the article only after its arrival at the market. The animal should be examined before the killing, as disease is often manifest before death. A great deal of expense would thus be saved, to say nothing of the advantage accruing to health.

It must always be remembered that adulterators are

to be prosecuted—not necessarily for selling a harmful article, for their goods are frequently, generally indeed, quite harmless—but for practising fraud. This is the line taken by our Boards of Health. Oleomargarine, for example, has been proved to be pure, and its manufacture goes unchecked; but when oleomargarine is sold for butter, a fraud ensues, and the public suffers. The American people, as a mass, hate dishonesty, and will support all legitimate efforts to suppress it.

PLUMBING LAWS.

The Boston plumbing law seems to be regarded as a dead letter, and to remedy this state of affairs, efforts are being made to transfer its enforcement from the Building Department to the Board of Health. Without meaning to cast any reflections upon the Building Department, this must be conceded as a wise movement, for the Board of Health is obviously the proper authority in such matters. My next letter, I doubt not, will convey to the readers of the *SANITARY RECORD* the practical results flowing from this transfer if it is accomplished, as I think it will be.

Baltimore has joined her sister cities in putting forth stringent plumbing laws. The Inspector of Plumbing appointed under the Act is a man who understands his business, and in whom the plumbers have confidence. These latter have fallen into the new order of things, and I have not heard of any arrests. In this enlightened age the great mass of plumbers are very willing to support all proper legislation, for they recognise that it brings with it its own reward in the shape of the increased confidence of the public. It is the plumbers, indeed, who are generally the first to move for plumbing regulations. The Baltimore law is deficient in one particular. Although registration at the Health Department is required, there are no provisions for examination of candidates. The Health Commissioner is acting as well as he can under such a limitation, and all candidates are pressed for assurance that they will comply with the laws.

Reports come from San Francisco that the plumbing regulations there enacted are being carried out to the full letter. Cases are being tried in Court for failure to register, and the Supreme Court has been appealed to in one instance by a man who used common galvanised pipes for soil-pipes, without traps or means of ventilation.

MR. JAMES B. PETTER, of Yeovil, has issued a new catalogue of the Nautilus Grates, containing some new designs and clearly showing how these grates may be fixed in any fireplace.

FISH FOR THE WORKING CLASSES.—One of the results of the late Fisheries Exhibition has been the pushing of a new system of co-operation among working men, whereby they can, with the aid of their employers, obtain good wholesome fish for dinner at wholesale prices. The plan was introduced into Darwen some time ago, and has been lately tried at Messrs. Pilkington Bros. & Co.'s Park Place and Audley Range Mills at Blackburn. The hands were able to obtain skate, cod, fluke, and haddock at an average cost of 2½d. per lb., and halibut and turbot at 6d. It is supplied by Mr. R. Mills, of Grimsby. The trial proved so satisfactory that a second consignment of 4 cwt. has been obtained. There are about 450 work-people employed at the mills. The masters permit them to use the mill for the purpose of distributing the fish, and help beside in other ways.

CHOLERA.—HOW TO PREVENT IT.*

By SIR ROBERT RAWLINSON.

I HAVE lived through the prevalence of cholera in England in the years 1832, 1849, 1853, 1865, and in the Crimea 1855. Having visited and officially inspected seats of cholera at home and abroad, having also read up the literature of cholera and considered some of the theories advanced as to the causes of the disease, I wish at the outset to say that I have no theory of my own, and I fail to recognise in any theory sufficient fact to induce me to believe in speculations not based on established principles. Many of the reputed causes of cholera are ever present in crowded cities, towns, and villages—such as polluted subsoils, polluted water, putrid or semi-putrid meat, stale fish, unripe fruit, and intoxicating drinks; there are also foul cesspools, filthy and overcrowded tenements, and unspeakably dirty people—but no cholera.

When cholera rages as an epidemic it is in a sense arbitrary in only covering acres capable of being defined, and not spreading broadcast over continents. It, however, strikes crowded seaports, and travels along lines of greatest human intercourse; low sites seem to favour it, but elevation does not exclude it, as both yellow fever and cholera have prevailed occasionally at elevations up to 4,000 feet. Stratification is not answerable for cholera, as, if there are human beings living in sufficient numbers on granite, cholera may rage with as great virulence as on the tertiary. The first and prime element in a cholera epidemic is necessarily human life, which to generate the disease in its greatest intensity must be massed on swampy or low undrained sites, having been long occupied, unceasingly fouled, and densely crowded. Seaports, and the banks of rivers, may thus be said to breed cholera, but sewer and drain these sites, remove foul privies and cesspools, regulate the tenements, and at short intervals cleanse, ventilate, and limewash the slums, and cholera, if introduced, will not spread. Since the year 1848, the date of the first Public Health Act, very many millions sterling have been expended on main-sewering and house-draining, on establishing waterworks, and on streets improvements. I have had something to do with the movement, and must plead guilty to some of this expenditure. I have no reason to repudiate this class of works, but I do wish to exalt something much simpler and cheaper—namely, systematic and thorough scavenging, as, unless this is established and attended to, the sanitary engineers will to a considerable extent have worked in vain. The engineers must so sewer as to enable the entire abolition of cesspools and deposits to take place; to bring in an abundant and pure supply of water to be at constant service, and be taken by service-pipe and tap within the walls of every occupied house and single-room tenement. This, and this only deserves the name of a modern domestic water supply. There must also be closet accommodation and drains to remove soil and waste water. Do all this to the greatest perfection, and then establish and maintain unceasing scavenging, as on the full and proper execution of surface scavenging will depend the crowning results of modern sanitary measures. There must be no blackmail levying by dust-carts, nor sulking neglect if their tribute is not freely paid. There must be a water-van brigade, every water-van being specially

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flush sewers and drains as required. lute and sole control of the waterworks e in the hands of the municipality, ater at prime cost may be used without ll sanitary purposes, as by hose and jet to urts, yards, and passages, pavements and —equal to that effected now and then by a lower—this will be the ultimate aim of z. All that water can remove must be way; all matter liable to become putrid consumed by fire. There must be no ge heaps of refuse stored and sorted to tions to be sold as manure, every pound tained for such manure having cost two rling or upwards to bring it to any avail- et. In Liverpool, Dublin, and some other vns this refuse either is or will be disposed er-barges into the sea: there can be no ny in retaining refuse liable to become offen- midst of populations waiting for a market. preceding remarks do not indicate in ee what may be done to prevent a spread the writer will have missed his mark and n foolishly. In anticipation of cholera on of Great Britain and Ireland, temporary tals—roomy and airy—may be erected in spaces; water-tanks on wheels—street , in fact—to take fresh water, may be heaps of foul refuse may be covered over lime, if near human dwellings, as to stir fuse to remove it under a blazing sun will e poking up a slumbering set of inflam- bustibles. Cleanse and wash crowded alleys; cleanse, ventilate, and lime-wash if necessary; all crowded tenements, ouse-to-house inspection, insist on instant the sick to hospitals, compel burial of the ort intervals, and disinfect clothing and If there are no means for public washing cting let such be established, as portable : apparatus is an easy thing to purchase. should be done carefully and gratuitously r, when they will aid the local authorities. or be spoken to by ministers of religion ominations, let the measures taken to d disinfect be explained by popular o that local rioting and hospital wrecking ided. Teach by precept and example, and not removed, will be greatly weakened. : stated that ships in seaport towns should as temporary cholera hospitals, nor old any sort, such as several storied disused ; but put up large and airy temporary als, having abundant ridge ventilation, atients from direct draughts of air, clothe ly, and diet simply, water or milk being a final warning, I say, for the present, ols alone—that is, don't disturb them a of lessening the evil, but as far as pos- m off from house connections and dis-

the various Continental cities, with their spools, will be wise to let their 'sleeping dormant cesspools—alone at present, as will only add fuel to active fire. Their t be on removal to temporary hospitals try, and surface cleansing, fumigating, z, and ventilation. In India the scavenger e officer are the right hand of the medical scavengers cleanse and burn all burnable ollice officer guards the supplies of water.

THE SANITARY RECORD.

JULY 15, 1884.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

THE NOTIFICATION OF INFECTIOUS DISEASES.

IT has come to be almost a commonplace of sanitary literature to read that the question of the notification of infectious disease has entered upon a new phase—the said new phase usually being a declaration by some one or another person or committee supposed to speak with authority, that notification is, or is not, desirable and necessary for the protection of the public health. It is true that the crude notions that were at one time extant about notification and its uses are getting gradually discredited; and it has come now to be generally admitted that the mere sending in of a number of half-crown certificates to the local sanitary authority does not necessarily imply an immediate reduction of the death-rate from zymotic diseases. Notification is, in fact, only one precaution out of a large number of others, both dependent and independent of it, that need to be taken if infectious outbreaks are to be crushed in their infancy. Sanitarians of the more superficial order demand the compulsory notification of zymotic diseases as though it were an unfailing panacea for and preventative of epidemics. But the mere piling up of statistics is of no avail against the onward march of disease; and it is hardly worth while to ask for information unless it can be put to some useful purpose. As a complement to notification, powers of forcible entry by the sanitary officials and wider powers of removal to hospital are apparently needed if the fullest use is to be made of the information thus gained; and it is not difficult to foresee that this would involve very strained relations between the health officer and the medical attendant, as well as between the sanitary authority and the householder.

We have set out these considerations, certainly not from any antagonism to the principle of compulsory notification, of which, ever since the establishment of this journal, we have been consistent advocates, but because it has appeared to us that in the recent discussions on the subject notification has been regarded too much from the theoretical rather than from the practical view-point. Even in Sir Lyon Playfair's excellent remarks at the inauguration of the juries of the International Health Exhibition, 'disease registration' was spoken of in terms that seemed to invest with a wholly undue importance the weekly sheets of infectious sickness. It is precisely in proportion to the *action* which is taken upon these indications of disease that the success or failure of such a system rests. Death-rates are the only tests at present available of the efficacy of sanitary action, and probably our readers will need no caution that rigid conclusions cannot properly be drawn from death-rates.

Pending the Committee of Inquiry or Royal Commission that has been called for as to the working of the notification of infectious diseases in those towns where it is compulsory under local Acts, it has appeared to us useful to attempt as far as possible the testing of the principle in question by the statistical method—a method admittedly imperfect, but still the only one at present open to us. With this view, we have entered into correspondence with the health officers of the thirty-eight towns in which notification is compulsory, and have invited their co-operation in sending us each month a tabulated statement of the notified cases and deaths from certain specified diseases which have been registered in their boroughs. Of the results of this appeal we shall speak further on; but meanwhile it may be convenient to give the names of the thirty-eight towns which were more or less in the mouth of every speaker at the two separate discussions which took place on the subject last month in the Conference Room of the International Health Exhibition. The towns are:—

	Act of		Act of
Aberdeen	1881	Huddersfield	1880
Accrington	1882	Jarrow	1878
Barrow-in-Furness ..	1881	Lancaster	1880
Birkenhead	1881	Leicester	1879
Blackburn	1879	Llandudno	1879
Blackpool	1879	Macclesfield	1882
Bolton	1877	Manchester	1881
Bradford (Yorks) ..	1881	Newcastle	1882
Burnley	1883	Norwich	1879
Burton-on-Trent ..	1878	Nottingham	1878
Bury	1882	Oldham	1880
Chadderton	1882	Portsmouth	1883
Derby	1879	Preston	1880
Dundee	1882	Reading	1881
Edinburgh	1879	Rotherham	1879
Greenock	1877	Salford	1882
Halifax	1882	Stafford	1880
Hartlepool	1883	Stalybridge	1881
Heywood	1883	Warrington	1879

In the Diary for 1884 of the SANITARY and MEDICAL RECORDS, an elaborate table was given showing the various systems of notification in force in each of these towns; and this table has served as the text for many of the recent references to the question. The Diary has been for some time out of print; and it would take up too much space to reprint the table in these columns. But it may be stated generally in all the thirty-eight towns but two, Aberdeen and Edinburgh, the *occupier* is bound to give notice to the sanitary authority in case no medical man is in attendance. In six towns he is exempted from notification if there is a medical man in attendance, but in thirty he has to notify in any event. At only one town—Greenock—is the doctor exempted from notifying cases. Notification by the *medical attendant* has to be made to the medical officer of health in twenty-three towns, and to the sanitary authority in eleven towns. The three towns that have adopted the method of the medical attendant handing a certificate of the nature of the disease to the occupier, who is responsible for its transmission to the sanitary authority, are Bradford, Norwich, and Nottingham. At Aberdeen and Edinburgh the medical attendant has the entire responsibility for giving the needful notification. The whole of the twelve more recent Acts (those passed in the sessions of 1882 and 1883) have been passed on the model adopted by the Select Committee of 1882, presided over by Mr. Sclater-Booth.

It was of course too much to hope that the officials of every one of these thirty-eight places would respond to our invitation to forward us particulars of their infectious sickness. No compiler

ever yet obtained a complete set of facts unless he had at his back the enforcement of a penal non-compliance; and the SANITARY RECORD is yet in these relations with medical officers of health. It will be seen from the list given above that a number of the towns have only recently obtained powers for compulsory notification; and the reason to believe that in some, at least, of these systems has not yet got into working order. Others, again, particularly in watering-places, a mistaken notion prevails that the facts known to the sanitary department should be kept as secret as possible 'with the view of preventing any panic.' We cannot now stop to argue against this excessively narrow-minded view of the objects and purposes of notification; we only mention it as a factor in the impaction of the information vouchsafed to us. It is satisfactory to be able to announce, however, that practically all the health officers who are entrusted with their local authorities, and are untrammelled by less fetters forged by sanitary committees, have responded cordially to our request, several of them speaking in warm terms of the usefulness of the proposed tables. As it is thought better to begin with the figures for the beginning of a half year, rather than with those for the first half of the first half, we shall not this month statistically the figures with which we have favoured, but shall content ourselves with a merest outline of the general outcome of the returns.

As a rule, measles is not included among diseases to be notified. Judging, however, from death returns, there appears to be more of it than might be expected. Accrington had 4 cases last month, Bolton 4, Burnley 7, Dundee 10, Oldham 24, Salford 6, and Warrington 10. Edinburgh cases of measles are notified to the Medical Officer of Health, and here 131 cases so reported during the month of June, though two deaths were registered. At Reading measles is notified, sixteen cases being recorded last month.

Whooping-cough again is usually not included in notification returns, but it is notified at Aberdeen where 108 cases (with three deaths) were reported last month; 36 deaths from this disease also occurred at Edinburgh.

The effects of the recent hot weather on the mortality from *diarrhœa* had apparently manifested themselves, for at none of the towns were the deaths unusually numerous.

Of the more serious zymotic diseases, *scarlatina* appears to be unduly prevalent, especially in Lancashire. At Aberdeen 19 cases were notified in the month; at Bolton, 45 cases; at Bradford, Yorks, 31 cases and 3 deaths; at Burnley, 12 cases and 2 deaths; at Derby, 22 cases; at Dundee, 15 cases; at Edinburgh, 86 cases and 2 deaths; at Huddersfield, 11 cases; at Newcastle, 44 cases in the month; at Oldham, 17 cases and 5 deaths; at Preston, 23 cases and 3 deaths; at Reading, 10 cases; and at Salford, 68 cases and 4 deaths.

Diphtheria was chiefly prevalent at Aberdeen where 8 cases occurred with 5 deaths; at Dundee, 2 cases and 2 deaths; and Edinburgh, 19 cases and 3 deaths.

Enteric fever was disproportionately prevalent at Bradford, 6 cases and 4 deaths; Burnley, 10 cases and 2 deaths; Dundee, 10 cases and 2 deaths; Edinburgh, 46 cases and 4 deaths; Oldham, 10 cases and 2 deaths; Salford, 10 cases and 2 deaths; and Warrington, 10 cases and 2 deaths.

ases; Preston, 8 cases; Salford, 15 cases and 6 deaths.

Typhus fever appears in the returns of Aberdeen, 1 case; Bradford, 1 case and 1 death; Burnley, 1 case; Dundee, 1 death; Edinburgh, 4 cases; Jarrow, 1 case and 1 death; and Salford, 2 cases and 1 death.

THE LEGAL ASPECT OF CREMATION.

A FEW months ago the advocates of introducing the practice of cremation into this country had their hopes raised by the ruling of Mr. Justice Stephen, in the case of *Dr. Price*, that cremation, as a mode of sepulture, is not itself illegal, but that in order to make it a crime it must be conducted in such a manner as to offend against public decency or against some of the positive requirements of the law. The decision was followed by the introduction into the House of Commons of a Bill for regulating the practice and preventing its abuse; but many members of Parliament chose to regard it as a Bill for legalising a practice which they disliked (forgetting that it was already decided to be legal), and the Bill was defeated. Many persons, both supporters and opponents of the practice, considered that the rejection of the Bill left cremation without any legal regulations or restrictions; but the law courts have recently shown that this is not so.

During the last spring assizes two women, named Stephenson, were convicted before Mr. Justice Hawkins at Leeds, on a charge of preventing a coroner's inquest by burning the body on which it was to have been held. Their case came the other day under the consideration of the Court for Criminal Appeal, and that court unanimously held the conviction to be right. The judges ruled that 'it is an indictable misdemeanour at common law to prevent a coroner from holding an inquest where the coroner has jurisdiction to hold it; and that, if he has information given to him upon which he might reasonably determine to hold an inquest, even though that information were not well-founded, it was sufficient to give him jurisdiction. The object of holding an inquest is to ascertain what was the cause of death, and how the deceased came by his death; and if persons, having possession of a dead body upon which there are reasonable grounds for the coroner to hold an inquest, were to be at liberty to destroy it, and so prevent the inquest, the consequences would be most formidable, and it would undoubtedly tend to give impunity to murder by destroying those traces by which alone the murder could be detected.' Upon the above grounds the conviction was upheld, and it may now be taken as settled that it is illegal to burn or otherwise make away with a corpse, in cases where an inquest ought to be held or has been ordered. In other cases, if he burning is conducted in such a manner as not to cause a nuisance or offend against public decency, there is no rule of law to prevent this mode of disposing of a corpse being adopted. Those who choose to adopt it must, however, take upon themselves the risk of doing so. As the practice is not regulated by statute, but merely by the unwritten rules of the common law, it is difficult to know beforehand what may or may not be done. A great deal of popular prejudice on the subject undoubtedly exists; and one who conducted a cremation might not improbably find themselves in the position of having to answer a charge of misdemeanour. Whether they

would be convicted would depend not only on the circumstances of the case, but on the temper of the jury, which upon such a question might happen to be extremely unreasonable. Whichever way the verdict were given it would probably not be disturbed, and at present a man who, with the best possible motives, conducted a cremation, might find himself branded with a conviction as a criminal.

The result of the legal decisions which have been given, and which commend themselves to common sense, coupled with the illogical refusal of the House of Commons to touch the question at all, is that cremation is not prohibited by our law, but in this country it is not safe for anyone to attempt to carry it out.

DISUSED BURIAL GROUNDS AS BUILDING SITES.

A DECISION which was given recently before Mr. Hannay, one of the Metropolitan police magistrates, seems likely to unsettle the law as to what is a proper site for building. The decision was given on the hearing of certain summonses which were taken out against a builder named Chambers, in order to prevent his erecting buildings on a plot of ground which was formerly known as the Peel Grove burial ground. The ground was laid out many years ago by its then owner as a burial ground under the name of the North East London Cemetery, but appears never to have been consecrated. It was, however, very extensively used, and during the eleven years previous to the year 1855, when it was closed by an order in Council, it was estimated that 20,000 persons were buried there; the graves were crowded, and many of the coffins were within four feet of the surface. After it was closed for burial, the owner removed the headstones and levelled the ground; rubbish was subsequently shot there, and recently the defendant, who had become the freeholder, commenced to build in spite of the prohibition of the Metropolitan Board.

If the ground had been consecrated, it is settled law that nothing short of an Act of Parliament could have authorised its conversion to secular purposes. A railway company might, under Parliamentary powers, have taken possession of it, and obliterated all traces of its ever having been a cemetery, as has been done in the case of many London burial grounds, or the ground might have been turned by the parish into a public garden: but it would have been impossible to build upon it. As, however, there was no evidence of its consecration, the Board were obliged to rely on their ordinary powers. They relied upon a by-law, made in pursuance of the Metropolitan Buildings Act, 1878, which provides that 'No house, building, or other erection, shall be erected upon any site, or portion of any site, which shall have been filled up or covered with any material impregnated or mixed with any faecal, animal, or vegetable matter, or which shall have been filled up with dust, slop, or other refuse, or in, or upon which, any such matter or refuse shall have been deposited, unless and until such matter or refuse shall have been properly removed by excavation or otherwise from such site.' The Act provides by section 14 that 'the term foundation shall mean the space immediately beneath the footings of the wall;' and the by-law requires the foundations of the walls of every house or building to be 'formed of a bed of good concrete, not less than nine inches thick, and

projecting at least four inches on each side of the lowest course of footings of such walls.' The buildings complained of had been erected *above* the soil in which interments had taken place, and without removing or disturbing the human remains which were there. Concrete foundations had been placed for the support of the walls, but otherwise nothing had been done to render the houses safe or habitable as regards the soil on which they were erected.

Upon the above facts being proved, the magistrate dismissed the summonses, holding that the by-law above referred to was intended only to apply to cases where artificial rubbish, impregnated with injurious matter, had been employed for the foundations of houses and buildings (in which he was probably right); and that it did not apply to such a case as the one before him. We are glad to see that the Counsel for the Board announced his intention of appealing. The words of the Building Acts and of the by-laws made under them are wide, but not as clear as could be wished, and it is important that everyone should know whether the law gives power to prohibit building on such sites as that in question. If no such power exists, the interference of Parliament cannot be too soon invoked in order to remedy the deficiency. Some parts of London and of other large towns have, no doubt, in days gone by been erected upon disused burial grounds; and even now, when centuries have elapsed since the last interment took place, it is doubtful whether such sites are not a source of danger to the health of those who live on them. Now that we are alive to the importance of constructing and keeping healthy dwellings, it is clearly necessary that local authorities should have, and should use, the power to prohibit crowded burial grounds, which have only been closed in recent times, from being used as fitting sites for the erection of dwelling-houses.

NOTES OF THE MONTH.

DEFECTS IN MODEL DWELLINGS.

ATTENTION has been called by Captain Douglas Galton, the well-known sanitarian, in a letter to the *Times*, to the fact that the remedy sometimes adopted for the amelioration of the dwellings for the poorer classes is apt to become as bad as the disease, or, in other words, where miserable tenements are replaced by substantial buildings these latter may contain many defects from which the former were to a certain extent free. A case in point is instanced at the Health Exhibition, where a model is shown of a large block of buildings about to be erected by the Metropolitan Railway Company to replace those demolished by the construction of the Tower Hill Extension. The model and drawings show a lofty building of nine stories, between 80 feet and 90 feet high, built round a square; the square being divided transversely by a block of equal height, forming two spaces or wells, containing in each over 1,300 superficial feet, and to the bottom of which no sunlight could penetrate and no circulation of air would be possible. The Metropolitan Building Act is in a great measure responsible for the small areas to be left in such cases, as the space bears no proportion to the size of the building; and a block of this magnitude is not compelled to reserve an open space any larger than

is required for a comparatively humble tenement. This is obviously unjust, but landlords and builders as a rule take advantage of it to the full where their pockets are concerned. Sanitary precaution has perhaps in this particular instance allowed this evil to be somewhat exaggerated, as each of these wells has an inlet for fresh air by means of two large passage-ways on the ground floor, sufficient to give an upward draught if the air be circulating at all; and although it is distinctly advisable to obtain if possible a direct or thorough draught, the exigencies of the site do not always admit of this. And as regards the sunlight, we are for many months of the year debarred from a glimpse of it; and when we do obtain it, it is a question whether it is valued to the extent that it should be by any class. Be this as it may, when we remember the terrible places that these lofty and well-drained buildings replace, we are inclined to think that an improvement has been made, although not to the extent that is possible or to be desired; but there is no doubt that the remedy must be sought by obtaining more stringent powers to enforce the reservation of lighting areas in proportion to the extent of the building.

WATER RATES.

DURING the past month the time of the Police Courts, or at any rate the newspaper reports of their proceedings, have not been so much occupied with questions as to water rates as for some time previously. Householders and water companies are apparently beginning to know their position, and it may be considered that in most instances the rates have now been pretty well adjusted in accordance with the decision in Dobbs's case. One gentleman, indeed, wrote to the papers to announce the fact that the Grand Junction Company had actually, under the threat of legal proceedings, refunded some overpayments which he had made during previous years. This good fortune is not, however, one which many ratepayers can expect to have. As a rule they will find that the money which they have once paid, cannot be recovered back, and if their water rates have been reduced, they had better be content with their gain in the future and not rush into litigation for the sake of recovering a few shillings' overcharge of past years. As we have pointed out before, the result of the decision of the House of Lords is not to cause a general reduction of water rates. In some cases, and notably in the case of small houses, the rates have been slightly reduced, and people to whom the payment of a few shillings, more or less, is a matter of importance, have profited by the declaration of their rights. But the companies have done what they could to revise their rates without loss to themselves, and so far seem to have been successful. At the half-yearly meeting of the Chelsea company, the chairman told the shareholders that there had been no reduction in their income, nor did he believe there would be. They had revised their assessments, and wherever there had been any uncertainty as to the proper amount, they had felt it prudent *for the time* to take probably less than they were entitled to. The result had been that in not one single instance had they had a case in the Police Courts. The above statement shows the position adopted by the companies. They are now in a position of antagonism to the public, but wish to avoid hostilities if possible. Wherever they see a chance of raising an assessment or charging

for extras, they will seize it. If the ratepayers wish to keep their water rates down, they must watch them carefully, and without rushing into litigation must be ready in case of any fresh encroachment to protect their rights. The attempt to make war on the companies by means of confiscatory legislation has failed, for this session at any rate, but the companies are desirous, and from their point of view properly so, of making good their position as far as possible. Both parties are now inclined to stand on their strict rights, and neither can expect any concession from the other.

THE MANUFACTURE OF SMALL-POX.

A REPORT has just reached us of one of those extraordinary cases of recklessness in spreading disease of the most loathsome type, which we are at a loss whether to attribute to ignorance, cupidity, or utter indifference to the due consequences of such indefensible conduct. Mabel Wilson, a cowkeeper and milk retailer, has been fined 40s. and costs at the Newcastle Police-court for an offence which should have entailed a reasonably long term of imprisonment with hard labour. It seems that the woman is the owner of a house, in one room of which she lives with her daughter. In this room, 12 feet by 10 feet in dimensions, where her daughter's child had been suffering from small-pox for six or seven weeks, Mabel Wilson kept her stores of milk, and, with the assistance of the mother of the afflicted child, sold it without compunction to whoever was unlucky enough to want any of it. Eventually a neighbour found the matter out, and expostulated with Wilson, telling her that she should report the case to the medical officer. She, however, simply stated that she had had the services of a very experienced man, the said very experienced man being a chemist from whom she had bought some physic, but who had never seen the child. The neighbourhood at last revolted. Mr. Armstrong, the Medical Officer of Health, visited the place and found that the child was suffering from small-pox. The woman was summoned before the magistrates at the instance of the Corporation, the summons stating that on March 11, 1884, the defendant, then being the occupier of a house used for a human habitation, at Factory Yard, Gallowgate, wherein a certain inmate named Jane Ann Kitchen was suffering from small-pox, unlawfully did not, so soon as she became aware of the existence of the infectious disease, forthwith give notice thereof to the medical officer of health at his office, contrary to section 40 of the Newcastle Improvement Act, October 1882. The magistrates could not inflict a more severe penalty than 40s. with costs; but is it possible to imagine a more effective and repulsive factory of small-pox?

POISONING FROM SALMON IN A BULGED TIN.

PARTICULARS of the two fatal cases of poisoning from tinned salmon, which occurred lately at Wolverhampton, will serve to enforce the warning the public has already received as to the risk of using food of this kind unless thoroughly assured of its soundness. It appears that Sarah Dewen (51), her son, Frederick William Dewen (20), a cabinet maker, and her daughter, Agnes Dewen (18), purchased a tin of salmon for 7½d., of which they all par-

took at supper on May 21, the younger woman eating but sparingly. The man was first taken ill, suffering from abdominal pain, vomiting, coldness of surface, &c., and died the next morning. Then his mother and sister were attacked in the same way; and the mother, in whom the symptoms were from the first the most severe, died on the 24th. A younger sister, who just tasted the salmon, thought it bitter, and ate none. The medical man called in was of opinion that the symptoms observed might be caused by some animal poison being absorbed and affecting the nervous system, though he knew of no poison which would produce precisely the same results. The inquest on the bodies of the deceased was adjourned to permit of an analysis being made of the contents of the stomachs, &c., the small quantity of salmon left in the tin, and a tin of salmon having the same brand and procured from the same shop. At the adjourned inquiry the coroner read the report of the borough analyst for Wolverhampton. The examination by chemical means of the contents of the nearly empty tin yielded no evidence of poison, but on some tame mice being fed with small portions, one died in five hours, and another in six hours and twenty-five minutes. An infusion of tea, partaken of at the fatal meal, and portions of bread and bacon, were examined and found free from poison. The analysis of the viscera of the deceased man and woman gave the same negative results. No recognised poison demonstrable by chemical tests was present. It was noticed that the tin had the appearance of having been bulged by pressure from within, which would indicate that the fish had undergone some decomposition before the opening of the tin. The coroner said that it would be well the public should know the danger of bulged tins, and only purchase those with the ends depressed, showing properly sustained exhaustion. It would be well that all tins should be examined by some competent person before being exposed for sale. There was no law on the subject, but it would be much to the interest of vendors that they should themselves make a careful examination of all such goods received; they were well able to form an opinion as to the soundness or otherwise of the contents. While the jury were considering their verdict the coroner asked after Agnes Dewen. She was stated to be better, but not quite recovered. The verdict was that both the deceased persons 'died from the effects of poison contained in the salmon tin, arising from decomposition.'

METROPOLITAN AND PROVINCIAL SANITARY PROGRESS.

DURING the recent debate in the House of Commons on the London Government Bill, Sir Charles Dilke pointed out the apparently small improvement in the health of London as compared with that of other large English towns. He stated that while the death-rate in the past ten years in nineteen of the largest English towns had declined as much as 5·1 per 1,000 persons living therein, the London death-rate during the same period had declined only 1·1 per 1,000. He quoted these figures as giving in his opinion a very fair test of the effect of the Government of London upon the health of London as compared with the improvement of the health of other large English towns since the passing of the Public Health Acts of 1872 and 1875. Taking the three

years 1870-71-72, and the three years 1880-81-82, it is found that the annual death-rate in the former period in London was 23·4 per 1,000, and in the latter period it was 21·4. In the large provincial towns the rates were 27·2 and 23·0 respectively. The London death-rate, therefore, showed a decline of 2·0, and the large towns of 4·2 per 1,000 during the ten years. It will, of course, be noticed at once that, notwithstanding the greater decline in the death-rate of the large provincial towns, the rate of mortality in London, which has not shown so rapid a decline, is still below it. It will probably take a much longer period than another ten years to reduce the death-rate in these provincial towns another 4·2 per 1,000. Some exception was taken by members present to the assumption of Sir Charles Dilke that the death-rates he quoted were a test of the relative sanitary conditions of the metropolis and of the large provincial towns; and he is reported to have stated that the test of the death-rate in London must be altogether fallacious, unless a correction were made by including all the deaths of London residents which occur outside Registration London. It is difficult to see how this would greatly affect the argument that Sir Charles Dilke urged, for the proportion of deaths that occur outside the metropolis of London residents has probably not varied materially in the space of ten years, and the necessary correction applied to each of the London death-rates would hardly alter the amount of the decline which has taken place. It can scarcely be doubted, however, that the health of London would show a further marked improvement by the simplification and centralisation of sanitary authority. The present system, under which there are, according to Sir Charles Dilke, no less than seventy authorities dealing with infectious diseases, seems eminently suited to hinder that general metropolitan co-operation, especially in cases of epidemics, which alone can secure the success of efforts in the direction of further sanitary progress in the metropolis.

THE ADULTERATION OF FOOD AND DRUGS.

AN attempt has been made by the Local Government Board to secure a more general adoption of the Food and Drugs Act. In many districts, including large and populous cities, this useful measure is practically inoperative, while in others it receives but scant recognition from the local authorities. And perhaps but little progress can be expected until the constitution of these bodies is materially altered, for with a large proportion of small shopkeepers ruling their counsels it is hopeless to expect any radical improvement. It has often been pointed out that the Act of 1875 protects alike the buyer and the seller, and the central board, in issuing a circular letter to almost every sanitary authority in the country, has indirectly again drawn attention to this provision. The chief object of the letter is, however, to point out that 'any medical officer of health, inspector of nuisances, or inspector of weights and measures, or any inspector of a market, or any police constable under the direction and at the cost of the local authority appointing such officer, inspector, or constable, or charged with the execution of this Act,' may procure any sample of food or drugs, and if he suspect the same to have been sold contrary to the Act, shall submit the same for analysis. The task of collecting samples is one specifically laid upon inspectors

of nuisances by the Board's General Order of March 1880 prescribing the duties; but it rests entirely with the local authority whether or not they will instruct their officer to this effect. The circular is accompanied with extracts setting out the salient features of the Act, together with some useful instructions. A notable instance of the manner in which some local authorities carry out their important duties in this respect has recently occurred at Newington. In this district the Act has remained a dead letter, notwithstanding that the Local Government Board have made several efforts to bring about a better state of things. At a meeting of the Vestry, held a week or so ago, a member, in an outspoken speech, proposed that an inspector be appointed to carry out the provisions of the Act. He showed that at present a tradesman living on one side of a road could sell an adulterated article for which on the other side he would be prosecuted. He contended that this was a reproach to the local authorities of Newington, and should no longer be permitted to exist. This was followed by a discussion which reflected but little credit upon the majority of the members, who finally negatived the motion by a majority of 29 to 13.

UNCERTIFIED DEATHS.

DR. MACLAGAN, who has long complained of the imperfect and unreliable system of death registration carried out at Hexham, again calls attention in his last report to the lax manner in which investigations into the 'causes of uncertified deaths are conducted. Of thirty-eight deaths so returned in 1883, some were returned as the verdict of an inquest; some, as dictated by the coroner, from 'information received,' without any inquest having been held; and others were not certified at all. Even in cases where inquests have been held, frequently no medical evidence has been given. Dr. MacLagan thinks that were all cases of sudden death, or of deaths resulting from accident, or the subjects of suspicion, investigated by the health-officer, few of the causes of such deaths would remain undetected; but, unfortunately, no such cases came to his knowledge, except through the death register, and that frequently many days after the occurrence. Apart from this, it seems of the first importance that in all cases of suspicious death, and more especially amongst infants, the circumstances should receive a careful sifting at the hands of the coroner. The fear of publicity which attends these inquiries is known to exercise a wholesome effect on the minds of parents, and it might be well if the practice of holding them was adopted pretty extensively at Hexham.

CUTTING OFF WATER SUPPLIES.

It is much to be deplored that the Bill introduced by the Earl of Camperdown for the better regulation of the powers of metropolitan water companies should have fallen through, because the standing orders of the House of Lords had not been complied with. The Bill proposed that 'from and after the passing of this Act no supply of water shall be cut off unless the company shall have obtained an order granted on a summons to show cause why the supply of water shall not be cut off, and the order shall state when the cutting off may take place, as well as the reason for putting the power in force.' It is about this time of the year that the arbitrary and

often unjust manner in which the existing companies proceed to deprive houses of their water-supply becomes severely felt. In many cases it happens that the fault lies not with the tenant, but with the non-resident landlord. Thus, as Dr. Bristowe observes in a recent report on the circumstances of the poor in his district, not only are dwellings left for weeks without one of the first necessities of life, owing, it may be, to no default of the tenant, but the company coolly give the sanitary authority intimation of their proceedings, so that the vestry (acting in the interests of health) may take legal measures to compel landlords to have the water supply reinstated, and thus act as the company's cat's-paw. This practice obtains in almost every metropolitan and suburban district, and at Tottenham it is carried out very extensively. In the majority of instances the houses which are treated in this manner are occupied by the poorer class of people, who are not over-scrupulous in their habits. There is general uncleanness, and the lack of water leads to imperfect removal of excreta and consequent contamination of the air. As Dr. Watson, the local health officer, remarks: It is not difficult to see how an epidemic would spread with rapidity amongst the inhabitants of such houses, and it is fortunate that the illness which recently prevailed there was measles, and not one of the more dangerous and fatal of the zymotic diseases.

THE STATISTICAL WORKS OF DR. FARR.

It has long been the source of much regret amongst students of vital statistics, as well as among those practically interested in this branch of sanitary science, that the valuable statistical work of the late Dr. Farr is, from the form and manner of its publication, not generally available. The Sanitary Institute of Great Britain propose, in these circumstances, to publish a selection from Dr. Farr's official reports, papers, and addresses, and have confided the selection and editing of this memorial of his labours to the capable hands of Mr. Noel A. Humphreys, of the Registrar-General's Office. It is proposed that the volume should consist of not less than 450 pages 8vo., and that it be published at the price of 30s., or, to subscribers, one guinea, provided that the number of subscribers warrants the Institute in incurring the expense of publication. Intending subscribers are requested, therefore, to send in their names without delay to the Secretary of the Institute, in order that this Council may be able to determine whether they will obtain sufficient support to justify them in publishing the book.

PRECAUTIONS AGAINST CHOLERA IN THE TYNE.

At the last meeting of the Newcastle City Council Alderman Wilson, Chairman of the Tyne Port Sanitary Authority, stated it would be satisfactory to the inhabitants of both banks of the River Tyne to learn that the most vigilant precautions were adopted at the present time to prevent the importation of infectious disease from abroad. They had two inspectors who boarded every vessel that arrived in the Tyne from abroad, and, in addition to that, the Local Government Board had sent down a special inspector to assist in that duty. He trusted that this statement might allay any apprehensions that might be felt on the matter.

DISINFECTION AND CHOLERA IN PARIS.

ACCORDING to a Paris correspondent, writing to the *Times* on July 3, 'since Tuesday last a system of disinfection has been in operation at the Lyons Station, in Paris, for all passengers arriving there from Toulon and Marseilles or other infected places. Special carriages are reserved for such passengers and their luggage. On arrival in Paris the former are conducted into a waiting-room, the interior surface of which is covered with sawdust impregnated with lime and salts of copper. In this waiting-room there are vases containing a mixture which gives off enough nitrous acid to effect disinfection without impeding respiration. The passengers pass half an hour in this place. Meanwhile the luggage is conveyed to another room, opened, and the contents spread out. The room is then closed, and everything is submitted for a quarter of an hour to intense nitrous vapour. This measure is enforced by virtue of an order of the Prefect of Police, which has been issued pursuant to a law of 1790 and to an order of the Consuls of the 12th Messidor, year VIII.'

What useful purpose this mode of disinfecting may serve, unless to allay the fears of nervous persons, we do not know, and having regard to the nature of the disease, we do not see the value of the application of intense nitrous vapour to the respiratory mucous membrane. It may, moreover, be attended with no little danger to persons who had been wintering abroad on account of weak lungs. It would, we think, be more useful to examine the clothing of the passengers, particularly their underclothing, and in certain circumstances to see that these were destroyed and the passengers previously bathed and supplied with new clothing, or previously sent to a hospital, where they might be under medical supervision. We would suggest that all persons arriving in Paris from cholera districts be medically examined, that such as are not in a satisfactory state of health be placed under medical supervision, that such as may be suffering from diarrhoea be sent to hospital and their clothing destroyed, and that the names and addresses of those who appear to be in good health be sent to the sanitary authority of their respective places of abode, so that, in the event of their becoming subjects of diarrhoea, they might be promptly dealt with.

DR. BROUARDEL, member of the Academy of Medicine and professor of Medical Jurisprudence at the Paris Faculty of Medicine, has been elected to replace the late Professor Würtz as president of the Comité Consultatif of Public Health.

THE NATIONAL HEALTH SOCIETY'S PUBLICATIONS.—We spoke last month of an excellent little pamphlet about vaccination, which the National Health Society was suggesting for house-to-house distribution in the metropolis by the officers of the several Boards of Guardians. We are glad to find that the pamphlet has since been virtually adopted by the Local Government Board, who have officially recommended its circulation in a letter which they have addressed to the Metropolitan Guardians on the subject of the present epidemic of small-pox. Many thousands of copies of the pamphlet—not far short of 150,000 in fact—have been distributed during the last few weeks, and the demand still continues. Encouraged by this success, and always with the view of doing useful public work, the society has prepared a similar leaflet about cholera, the issue of which may be expected immediately.

THE PUBLIC HEALTH

DURING JUNE 1884.

THE mean temperature at the Royal Observatory, Greenwich, during the month of June was $58^{\circ}0$; it was below the average June temperature in one hundred years, and was $1^{\circ}0$ below that recorded in the corresponding month of last year. An excess of temperature prevailed on ten days during the month, while on eighteen days it was below the average. The warmest day of the month was the 27th, when the mean was $66^{\circ}6$, and $4^{\circ}6$ above the average; the coolest day was the 6th, when the mean did not exceed $49^{\circ}5$, and was $8^{\circ}8$ below the average. Rain was measured at Greenwich on eight days during the month, to the aggregate amount of 2.2 inches, which exceeded by the fifth of an inch the average June rainfall in sixty-one years. During the first six months of this year the rainfall amounted to 8.9 inches, which was as much as 1.9 inches below the average rainfall in the same period of sixty-one years. The sun was above the horizon during 494.5 hours during June, but only 134.3 hours of bright sunshine were recorded at Greenwich; this amount was below the average of the corresponding month of the five preceding years 1879-83. The wind was very variable during the month, except from the 12th to the 22nd, when north-easterly winds prevailed.

In the twenty-eight large English towns dealt with by the Registrar-General in his Weekly Return, which have an estimated population of nearly eight millions and three-quarters, 23,243 births and 12,976 deaths were registered during the four weeks ending the 28th ult. The birth-rate, which had been 34.8 and 35.5 per 1,000 in the two preceding months, declined to 34.6 during June, and was slightly below that recorded in the corresponding month of either of the two previous years, 1882-83. The lowest birth-rates last month in these twenty-eight towns were 28.3 in Brighton, 29.2 in Halifax, and 30.2 in Huddersfield; the rates ranged upwards in the other towns to 40.2 in Nottingham, 40.5 in Cardiff, 44.2 in Preston, and 45.1 in Sunderland. In London the birth-rate last month was 33.1, while it averaged 35.8 per 1,000 in the twenty-seven provincial towns.

The annual death-rate in the twenty-eight towns, which had been 22.1 and 20.7 per 1,000 in the two preceding months, further declined to 19.3 during the four weeks of June, but slightly exceeded the rate recorded in these towns in the corresponding period of 1882 and 1883, when it was 19.0 and 19.1 per 1,000 respectively. The lowest rate of mortality last month in these towns was 12.9 in Brighton. The rates in the other towns, ranged in order from the lowest, were as follow:—Brighton, 12.9; Norwich, 14.9; Bristol, 15.3; Derby, 15.8; Leicester, 16.0; Hull, 16.3; Birkenhead, 17.2; Bradford, 17.4; Nottingham, 17.5; Salford, 18.1; Newcastle-upon-Tyne, 18.4; Sheffield, 18.6; London, 18.7; Birmingham, 18.7; Cardiff, 19.0; Huddersfield, 19.4; Plymouth, 20.1; Bolton, 20.5; Preston, 20.8; Blackburn, 21.4; Sunderland, 21.6; Leeds, 22.1; Halifax, 22.7; Manchester, 23.1; Oldham, 23.6; Wolverhampton, 23.8; and the highest rate during the month, 25.6 in Liverpool. While the death-rate in London during June, as above stated, was 18.7 per 1,000, it averaged 19.9 in the twenty-seven provincial towns. The 12,976 deaths from all causes in the twenty-eight towns during the four weeks of June included 2,026 which were referred to the principal zymotic diseases, of which 618 resulted from measles, 490 from whooping-cough, 250 from diarrhoeal diseases, 238 from scarlet fever, 180 from small-pox, 152 from 'fever' (principally enteric), and 98 from diphtheria. These 2,026 deaths were equal to 15.6 per cent. of the total deaths, and to an annual rate of 3.02 per 1,000. This zymotic rate showed a slight further decline from the rates in the two preceding months, but exceeded that recorded in the corresponding month of either of the two previous years. The death-rate in London during June from the principal

zymotic diseases was equal to 3.6, and exceeded by as much as 1.0 per 1,000 the average rate in the twenty-seven provincial towns, among which this zymotic rate ranged from 0.1 in Brighton, 0.3 in Derby, 1.1 in Bristol, and 1.3 in Hull, to 3.6 in London and in Cardiff, 3.8 in Oldham, 4.6 in Liverpool, and 4.7 in Wolverhampton. Measles caused the high zymotic death-rates in London, Oldham, and Wolverhampton, and scarlet fever in Cardiff.

Measles was the most fatal zymotic disease in the twenty-eight towns during June. The death-rate from this disease, which in the two preceding months had been 0.96 and 0.94, further declined to 0.92 during June, although it considerably exceeded the rate in the corresponding period of either 1882 or 1883. In London the rate of mortality from this disease was equal to 1.03 per 1,000, and showed a very slight decline from the high rate in the preceding month; in the provincial towns the measles death-rate averaged 0.83, but was equal to 1.89 in Liverpool, 2.12 in Blackburn, 2.55 in Oldham, and 3.99 in Wolverhampton. The rate of mortality from whooping-cough, which had been 1.10 and 0.96 per 1,000 in the two preceding months, further declined during June to 0.73, which, however, considerably exceeded the rate in the corresponding period of last year. The fatality of whooping-cough in London was again almost twice as great as in the provincial towns, among which it was excessive in Sunderland and Liverpool. The death-rate from diarrhoeal diseases was considerably below the average of corresponding months in recent years. The rate of mortality from scarlet fever, which had steadily declined in the seven preceding months from 0.84 to 0.40 per 1,000, further fell to 0.35 during June, and was lower than in any month on record. In London the scarlet fever death-rate was equal to 0.33, while it averaged 0.38 in the twenty-seven provincial towns, and was equal to 0.80 in Leeds, 1.30 in Sheffield, and 1.40 in Cardiff. The death-rate from 'fever' (principally enteric or typhoid) showed a slight increase upon the rate in the preceding month; the highest rates of mortality from this disease last month were 0.52 in Newcastle-upon-Tyne, 0.53 in Salford, and 0.98 in Portsmouth. The death-rate from diphtheria almost corresponded with the rates in recent months; the prevalence of this disease was almost entirely confined to London, Portsmouth, and Cardiff. During the four weeks of June 180 fatal cases of small-pox were registered in the twenty-eight towns; showing a considerable further increase upon the numbers in the four preceding months; of these, 137 occurred in London, 24 in Liverpool, 6 in Sheffield, 4 in Sunderland, 3 in Hull, 3 in Cardiff, 2 in Manchester, and 1 in Birmingham. Judged by the returns of the Metropolitan Asylum Hospitals, the prevalence of small-pox in London showed a further considerable increase during June. The number of small-pox patients under treatment in these hospitals, which in the eight preceding months had increased from 41 to 1,057, further rose to 1,290 at the end of June, and exceeded the number at any period since June 1881. The average weekly number of new patients admitted to these hospitals, which had been 52, 84, and 246 in the three previous months, further rose during June to 275.

The rate of infant mortality in the twenty-eight towns, measured by the proportion of deaths under one year of age to births registered, was equal to 126 per 1,000 during June, which differed but little from the rates recorded in the corresponding months of recent years. The rate of infant mortality in London was 126, and in the twenty-seven provincial towns it averaged 127, ranging from 57 in Brighton, 91 in Birkenhead, and 93 in Bristol, to 154 in Leeds, 161 in Liverpool, and 195 in Wolverhampton.

The death-rate from diseases of the respiratory organs, judged by the metropolitan returns, slightly exceeded the average during June. The weekly number of deaths referred to these diseases in London averaged 235, and the annual death-rate was equal to 3.1 per 1,000. In

Liverpool the annual rate of mortality from these diseases was last month equal to 5.1 per 1,000.

The causes of 312 of the 12,976 deaths registered in the twenty-eight towns during the four weeks of June were not certified, either by medical practitioners or by coroners. These uncertified deaths were equal to 2.4 per cent. of the total deaths, and corresponded with the rate in the preceding month. In London the proportion of uncertified deaths did not exceed 1.2 per cent., whereas in the twenty-seven provincial towns it averaged 3.4, and ranged from 0.9 and 1.0 in Brighton and Portsmouth, to 6.0 in Halifax, 6.3 in Sheffield, and 8.1 in Oldham.

Among the population living in the outer ring of suburban districts around London, estimated at rather more than a million persons, the annual death-rate during June from all causes was equal to 15.2 per 1,000, against 14.3 and 14.1 in the corresponding periods of 1882 and 1883. During the four weeks ending the 28th ult., 50 fatal cases of whooping-cough, 34 of measles, 22 of small-pox, 16 of scarlet fever, 16 of diphtheria, 14 of diarrhoea, and 8 of 'fever' were recorded in the outer ring. These 160 deaths were equal to an annual rate of 1.9 per 1,000, which was slightly below the rate recorded in the preceding month. The fatality of whooping-cough, measles, and diphtheria showed a decline. Measles, however, showed fatal prevalence in Edmonton and Bromley. The 22 deaths from small-pox registered in the outer ring included 16 in West Ham district (of which 10 were of London residents recorded in the Metropolitan Asylum Hospital at Dartford, 4 in Edmonton, and 2 in Isleworth sub-districts.

SEWAGE AS AN EVANGELISING AGENT.—The *Sanitary Engineer* of New York is responsible for the following amusing mixture:—A reporter had to attend two meetings, one for the conversion of the Jews to Christianity, and the other, which followed immediately after, was on the subject of conversion of sewage into lime and cement. In the printer's hands the folios got mixed up, and the report read: 'The chairman, after the meeting had been opened with prayer, explained that the conversion of the Jews was one of the greatest works that could engage the attention of our sanitary authorities. Filtration was the most perfect method that could be adopted for purification, but a filter had its limits. There was a popular notion that the sewage contained a vast amount of wealth, but the sludge must be taken out of it for purposes of irrigation, as it otherwise choked the pores of the land, and they were a wandering race spread over the whole face of the habitable globe. They were denied the inimitable blessings of Christianity, which might be counted by thousands of tons per annum allowed to run to waste, when by a judicious admixture of lime and clay, the benighted Hebrews who sat in darkness might easily be converted into lime and cement for building purposes, and if thus deodorised, after being first dried and burned in a kiln, this ancient race would once more take its proud position among the nations of the world. Subscriptions were earnestly solicited for the purpose, though he (the speaker) disclaimed any idea of making a profit out of the process, and, in conclusion, he urged increased efforts in the good work, showing that, thus deodorised by a very novel process of evangelisation in large tanks constructed for the purpose, the grateful Hebrews might flow over the land without injury to vegetation, while the expense of conversion, which was progressing as rapidly as the best friends of Christianity could wish, would be more than repaid by the sale of the phosphate of lime and valuable cement for building purposes.

In the last number of the *Revue d'Anthropologie* a paper by M. Charpy on the xiphoid angle, which incidentally exemplifies the mischief done to the natural symmetry of the female figure by tight lacing and other vicious customs in the matter of dress. They more or less disfigure all measures of the thorax taken after thirty years of age, and reduce the angle in question from its normal 75° 52° or even 45°.

SPECIAL REPORTS.

IMPROVEMENTS IN THE MANUFACTURE OF COAL GAS.

(BY OUR SPECIAL COMMISSIONER.)

SINCE its first introduction, gas has year by year increased in consumption, notwithstanding that it has been more vilified than any other illuminant invented. True, it blackens our ceilings and is injurious, to our gildings and hangings; and the abominable smell constantly being sent forth from gasworks by the withdrawal of the lime used in the process of purification and highly charged with sulphuretted hydrogen, which permeates the atmosphere for a considerable distance, is decidedly injurious to health. What, then, is the cause of this constantly increasing consumption of gas, in spite of the disadvantages attendant upon its use. The reason is that it is found to be the simplest means of providing a brilliant light, as well as a heating agent, a great economiser of time and trouble, as compared with other illuminants. It is at all times ready when wanted—a trusty servant that never fails us. It is affirmed by experts that gas is even yet in its infancy. If a gas can be made without the disadvantage of polluting the air with sulphuretted hydrogen, and where the gas itself can be manufactured of a purer quality, the greatest objections to its use are at once removed, and corresponding advantages from a sanitary standpoint are obtained. This desideratum is now within the reach of all gas companies: it cannot be said within the reach of all gas consumers, as, unless manufacturers of gas will avail themselves of it, consumers cannot share in its benefits. It is in the purification of gas that the greatest objection on public grounds lies, when the purifiers are opened, and the lime charged with the objectionable chemical already mentioned is discharged into the atmosphere. If a change in this direction is to be effected an alteration in the mode of purification must take place. That lime has an important influence for this purpose is well known, but the question has arisen whether it has been made use of at the proper stage of manufacture. It was in 1812 that Clegg introduced the wet lime process of purification, and, broadly speaking, this is the system that has been in general use ever since; but of late years attempts have been made to introduce the lime at an earlier stage in the manufacture. But it has been reserved for Mr. W. J. Cooper to reduce the deductions into a practical form. The inventor of the improved process introduces the lime in the first part of the operation instead of in the last. No alteration of plant is required, no expense even of the most trivial character is necessary, and it is difficult to understand how any gas company, having even its own interests only in view, can hesitate to adopt the new plan when its advantages are properly set forth.

At the Tunbridge Wells Gas Works, which by the courtesy of the directors I have had an opportunity of visiting, the Cooper system has been in use for the last ten months, to the entire satisfaction of the engineer, Mr. Dougall, and the inhabitants of the town. The testimony and experience of Professor Wanklyn, and Mr. R. P. Spice, C.E., who have closely watched the making of gas at these works by the Cooper process, are strongly in its favour. Mr. Cooper uses 'limed' coal instead of 'pure' coal for his process. The limed coal is made by taking quicklime, slaking it, and then mixing it with the coal, the proportions recommended being 2½ parts of quicklime to 100 parts of coal.

At Tunbridge Wells one of West's crushing machines is in use, which breaks the coal into small pieces and assists to incorporate the lime more perfectly with it. The limed coal is then put into the retorts, and the after process, until we come to the purifiers, is the same as that

of the old system. The advantages of using limed coal are, according to Professor Wanklyn (in which, however, it is only fair to say that Mr. Spice is perfectly in accord), as follows:—The coal yields a larger fraction of its nitrogen in the form of ammonia; it also yields a slightly larger fraction of its carbon in the form of the volatile compounds. It gives a *very much smaller* portion of its sulphur in volatile forms, and the non-volatile residuum, the coke, is found to be considerably improved in quality. In the distillation of the coal the lime forms, with the sulphur in it, sulphuret of calcium, which becomes so incorporated with the coke as to be quite inseparable from it, and when burnt this sulphuret of calcium, being in the presence of an excess of lime, remains in the ash, thus preventing the sulphur which it contains being given off in sulphurous acid, as is the case with coke made from coal only. Small as is the addition of lime to the coal and its after appearance in the coke, as above described, it has the effect of promoting combustion, as it acts as a conductor of oxygen, and causes the coke to burn more brightly and cheerfully—in fact, considerably better than ordinary gas-coke ever did or can burn. There has been no difficulty in selling this coke in the town, and the inhabitants speak highly of it. Having thus given the effect of the ‘liming’ on the coal, we find nothing different in the mode of manufacture until we reach the purifiers, the last process. Tunbridge Wells, for the size of the works, is remarkably well provided with purifiers, which has no doubt helped the engineer materially. In these purifiers, instead of the layer of oxide of iron and of lime, we find oxide of iron only in use, and these purifiers have not been opened for the purpose of revivifying or changing the material for nine months, and Mr. Dougall, the engineer, is of opinion that they may run another six months without requiring to be disturbed. A revivifying process is constantly in operation consisting of the admission of a little fresh air to the purifiers. By this means the process of revivification of the oxide of iron goes on simultaneously with that of purification, oxygen being taken up from the air, and admitted, and sulphur deposited in the free state in the material. Consequently, as Mr. Spice observes, the manufacture of gas is carried on entirely in closed vessels, with the comfort of knowing that if the lime process is adopted generally the olfactory nerves will never more be disgusted with the smell of sulphuretted hydrogen, or health injured by its inhalation, for it is one of the most important features in this arrangement that noxious gas is not given off by the purifiers. As to the quality of the gas, I have already said that one of the advantages of the limed Cooper system is that it yields a *very much smaller* fraction of sulphur in volatile form. It is well known that sulphur exists in crude gas principally in the form of sulphuretted hydrogen; but partly, also, of other volatile sulphur compounds. ‘The present regulations in London permit of 17 grains per 100 cubic feet in summer and 22 grains in winter. In the provinces the sulphur compounds rise in some instances to 40 and even to 60 grains.’ At Tunbridge Wells the amount of sulphur compounds in the gas has been as low as 3; but the average may be taken at about 12 all the year round. It must, however, be remembered, that this process is in its early infancy; and, in the opinion of the experts who have experimented with it, it is possible to reduce this product to nil with a little extra care. In fact, in one experiment made in the laboratory by the inventor, and related by Professor Wanklyn in a paper read by him before the Society of Chemical Industry, Manchester Section, Jan. 8, 1884, the absence of sulphur compounds was so marked that he recognised the gas as being fragrant rather than foetid; thus it appears that, by the limed coal mode of manufacture, it is possible to produce a perfectly pure gas, which, of course, obviates all objection to gas. Three important conditions in which the public are interested are fulfilled by the introduction of the limed coal process.

The air in the neighbourhood of gas-works is rendered pure by the non-evaporation of sulphuretted hydrogen, and the public health thus benefited. The gas rendered comparatively pure, and, probably, before long, absolutely pure, is free from the objections hitherto urged against it, while the advantages gained by the production of the improved coke are scarcely less than the others stated. A prospect of preventing the production of smoke without interfering with the susceptibilities of those who like their open fires, is opened up by placing within their reach a fuel that is not subject to any of the objections to ordinary coke, and is without smokeless. Had the late Dr. Siemens seen this coke he would have been delighted to find one of his most cherished notions so soon brought to a state of realisation. In looking at the commercial aspect of this invention, although it has no right to be weighed against public benefit, it is satisfactory to find that its adoption is beneficial to gas companies by the increased quantity of the products given off. There is a decided increase in the quantity of ammoniacal liquor, but this has varied at different gasworks where tests have been made, and, in Professor Wanklyn’s opinion, the arrangements for the collection and storage of the gas liquor in most gasworks, particularly the old ones, is very inadequate. Experiments made in the laboratory with limed and unlimed coal have shown that the former is capable of more than doubling the yield of ammonia; and the authority last quoted is of opinion that even on a large scale in gasworks similar results will soon be obtained, but at present the highest quantity realised has been about 9 lbs. per ton of coal, which is half as much more than the yield from unlimed coal. The increase in the quantity of tar at Tunbridge Wells has amounted to only two-tenths of a gallon per ton of coal, but on a large quantity of coal carbonised this gain would amount to a considerable item annually. The opponents of the process have urged that less gas can be obtained from the limed coal, but Mr. R. P. Spice has, I think, effectively proved that this is not the case, for in a special test made with 200 tons of limed coal and the same quantity of unlimed, 10 feet more gas was actually made, so the quantities made by either process may be put on a par, and the illuminating power of the limed coal gas is so very near to the other as, for all lighting purposes, to be practically the same. It is in reality some 0.14 in candle power less, its average light being 15.63 against 15.77 of the unlimed coal. This difference is too minute to be appreciable by consumers. This invention is very important from a sanitary point of view, and I know that many of your readers have the power in their hands to facilitate its adoption. Thoroughly convinced of the value of the system, Mr. Dougall at Tunbridge Wells will readily show every detail of the process. Although the limed process is applicable to every condition of gas making, I consider it of great value to those who manufacture it on a small scale, such as owners of mansions, factories, &c., the relief gained through not having to open the purifiers and discharge the highly-charged lime, and the absence of smell being great recommendations. A company has been formed to let the right for using Mr. Cooper’s patents by royalty, named ‘The Coal Distillation Company (Cooper’s patents), Limited,’ 18 Finsbury Circus, E.C., from whom all particulars can be obtained. This undertaking is being watched with interest by many, and it would be well if all authorities who are connected with the department of public health would inquire into the working of the Cooper process, with a view to obtaining its adoption in the districts in which they carry on their labours.

THE Conseil d’Hygiène et de Salubrité de la Seine has elected MM. Brouardel, Hardy, and Bezançon as their representatives at the International Congress of Hygiene and Demography, which will be held at the Hague on August 17 and 31.

COTTON SIZING IN ITS INFLUENCE ON HEALTH.

THE report of the commissioners, Messrs. J. H. Bridges and E. H. Osborn, who were appointed by the Home Department to inquire into the effects of heavy sizing in cotton weaving upon the health of the operatives employed, has now been issued. The starting-point of the investigation, which was the outcome of a memorial presented by the Trade Union Congress, complaining of the injury inflicted on the workpeople by over-sizing and by the introduction of steam into the weaving sheds, was the report of Dr. Buchanan, who made an investigation into the subject as far back as 1872. Since that date many and marked changes have taken place. The practice of artificial sizing has steadily increased, and the demand for articles so prepared is much more extensive than formerly, while the quality of the size has changed not less than its quantity. The use of china clay, which, in the period described by Dr. Buchanan, entered into the composition of the size to the extent of 33 to 37 per cent., has very largely increased of late years. It is obvious, then, that as the amount of dust in the sheds has been increased in proportion, the atmosphere would have been incompatible with respiration. This result has, however, not followed, since the manufacturers, though not, perhaps, on the ground of health, have taken extreme pains so to prepare the size that as little as possible of it shall be lost in the weaving. This object has been obtained by the addition of substances possessing an affinity for moisture by special processes of preparation. By rendering the atmosphere of the weaving shed artificially moist, the fibres of the warp are enabled to retain their weight of clay, with no greater loss by dust than was observed in the primitive days of clay sizing. With but two exceptions, dust was a notable feature in most of the weaving sheds. In one there was no occasion for heavy sizing, and in the other, where the proportion of size was very great, there was, however, but little dust. This was effected by the adoption of special modes of preparing and putting on the size, and it must therefore be admitted that the problem of weaving heavily-sized material without diffusion of dust is a soluble problem, and one indeed, where special skill has been used, that has actually been solved. An examination of the air, with reference to moisture, showed that the average amount of moisture in the weaving sheds was 5.38 grains per cubic foot, and the average percentage of saturation 76, a distinct increase as compared with the average moisture recorded in 1872, which was 4.5 grains. The excess over the moisture in the atmosphere outside was, in Dr. Buchanan's observations, 1.2 grains, while in the present instance it represented 2.38. This points unquestionably to an extension in the means adopted for damping the atmosphere of weaving sheds, which has tended to create a climate of a somewhat tropical and relaxing kind. In a series of observations made in 1873 of the air in the spinning-rooms of cotton factories, it was found that the average percentage of saturation in a large number of instances did not exceed 43, a state of things contrasting very forcibly with the percentage of 76 found in the sheds during the present inquiry. It was frequently stated by the workpeople that their clothing never felt really dry even in the morning until after it had been washed; and to meet this difficulty it is suggested that the outer clothing worn by the operatives should be hung outside the weaving shed, so as to be free from dust and moisture during the hours of work. Particular reference is made in the report to the very imperfect ventilation of the workshops, and of the great need that exists for improvement in this direction. The satisfactory ventilation of these large spaces is no easy matter, but the commissioners lay stress on the fact that with exceedingly few exceptions no adequate attempt to solve the problem has been made. As regards the injury inflicted upon the operatives, inquiry was made of twenty-seven persons selected at random

by the commissioners, and of twenty-nine brought before them by the Weavers Association. The evidence, as might be expected, differed considerably. Out of the first group seventeen made no complaint, but five had known of others who had suffered from the damp or from dust, though they themselves had not been affected. The remaining ten stated that they had suffered more or less from the damp, principally in the form of bronchitis, rheumatism, and neuralgia. The more prominent symptoms of the twenty-nine persons brought forward by the Association were dyspepsia, nausea, vertigo, rheumatism, and bronchitis; and, as far as the nature of the inquiry permitted a judgment, it would seem probable that the state of ill-health had been—if not caused, yet at least considerably aggravated by the conditions of their work. The report goes on to say: 'It seems to be evident that these conditions are not such as to prevent that large proportion of workpeople whose constitutions are naturally vigorous from following their calling without serious inconvenience. But there remains the proportion, also very considerable, who have a constitutional tendency to one form or other of rheumatic, phthisical, or dyspeptic ailment. Such tendencies cannot fail to be intensified by working continuously in an ill-ventilated atmosphere, whether pervaded by mineral dust or rendered artificially damp. In summarising the results of their investigation, the commissioners recommend—(a) that the processes by which very large quantities of size can be incorporated with the warp without necessitating the diffusion either of dust or of moisture should become generally known and applied; and (b) that the sheds should be thoroughly and effectually ventilated. They are convinced that if this last object be realised, complaints of injury from dust and steam would shrink to insignificant proportions.'

PROFIT IN STREET REFUSE.

AN AMERICAN DESTRUCTOR.

To turn street sweepings and house refuse of all sorts into money is the object of a strange machine now ready for work at the Jackson Street (East River) wharf, New York, of the Street Cleaning Department. Of course the conversion is not direct. Rags, old iron, broken glass, bones, cinders, and coal, are the media of change. The machine, according to the *Metal Worker*, is simply a vast rag and bone picker of many Italian-power, working by steam. The idea is a new one. Less than twelve months ago the machine was erected by a stock company on the Jackson Street wharf. Most of the intervening time has been given up to experiment, but now, it is said, the machine is perfected, and will sift and reduce to its elements all the refuse of whatever description that may be brought to it, to the extent of 150 loads of 1,800 lbs. each in a day of ten hours. The average amount of stuff brought to this wharf is estimated at 40 loads per diem, so that the sifter cannot be worked to anything like its full capacity. Out of 100 loads of ordinary refuse thrown into the sifter, it is claimed, only about 30 loads remain to be sent down the bays in the scows, the rest being utilised in one way or another.

The sifting-machine occupies a space about 40 feet long by 10 feet wide, covered with a shed on the end of the wharf. This shed is approached from the street end by an inclined plane which reaches nearly to its roof. The ash and garbage carts drive up this plane to a chute, through which they discharge their contents into the sifter within the shed. The matter falls on a tray, which has a resemblance to an old-fashioned Venetian blind extended horizontally. The weathers are so arranged that only narrow slits remain between them, through which nothing but fine dust can find its way. This tray is called the 'oscillator.' It moves to and fro in the direction of its length 250 times a minute, and, as it rocks, the stuff that has been thrown on it is distributed automatically along its entire length, which is about 10 feet. Two or three Italians stand alongside, and pick all the rags and scraps

of paper out of the mass. These are spread out near by to dry. All the fine dust falls through the slits in the oscillator into a narrow trough called the 'conveyor,' which will be further described presently. The solid residuum on the tray of the oscillator—the dust and the rags having been removed—is passed automatically into a vat of water called a 'washer.' The passage of a load of refuse through the oscillator takes about four minutes. In the washer the solid mass that comes from the oscillator is rapidly stirred up. All the straw, fragments of leather, vegetable refuse, and other light material rises to the surface, whence it is removed by Italians to a cremating furnace, and reduced to fine ashes. The coal, cinder, iron, glass, and other heavy objects fall to the bottom of the washer. They are passed through a second vat to cleanse them thoroughly, and from this they emerge strewn on a broad rubber, which moves slowly over rollers. Italians stand on each side. They pick out the bones, pieces of iron, and glass, and stones. The belt discharges the coal and cinder, which remain in a heap. The fine dust which falls from the oscillator is kept in constant motion through the trough of the conveyor by means of a ribbon of metal twisted spirally about a shaft rotating lengthwise in the trough. The dust is taken up by automatic elevating buckets from the end of the conveyor, and by them discharged into the scow. The contrivance is said to be of advantage both to the city and to the stockholders, since, instead of 150 loads of stuff only 30 have to be transported. The stuff left is so clean and healthy that it can be used for any purpose. All the garbage is burnt, and only fine, dry dust put on board the scows. The rags fetch about 20 dollars a ton; the old iron 40 cents. per 100 lbs.; broken glass is worth 30 cents. per 100 lbs.; bones are more valuable. Out of every load of 1,800 lbs. about 400 lbs. of coal and cinder are got, which is all the fuel needed to keep the machinery going.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

'Something attempted, something done.'

BERKSHIRE COMBINED.—Dr. Woodforde evidently devoted a large amount of attention during 1882 to the question of water-supply in this district, and he could scarcely have turned his energies to a better channel. It was hardly to be expected that the high standard of health which was reached in 1881 would be maintained. Nevertheless the statistics cannot be considered by any means unsatisfactory. The rates for deaths and births per 1,000 population were relatively 16 and 31. In Bradfield the rate of mortality was only 13·8; in Wallingford Urban it was 24·9. The births in the Rural Division of Newbury amounted to but 26·7 per 1,000 living; in the Urban Division of this district they amounted to 34·5 per 1,000. Something over 13 per cent. of the total deaths, or 2·1 per 1,000, were registered from the principal zymotic diseases. The zymotic death-rate was lowest in Bradfield, where it was '4, and in Easthampstead Rural and Abingdon Urban it was only 1·7, but in Newbury Urban it was as high as 4·2. The most fatal of the disorders of this class in the district last referred to, as also in Hungerford, was scarlatina. Diphtheria was accountable for the heaviest death-roll in Newbury Rural, whooping-cough in Wallingford Rural and Maidenhead Urban, and measles in Windsor. The infantile mortality was at the rate of 98 deaths to every 1,000 births, while 32·9 per cent. of the deaths at all ages occurred in children under 5.

BETHNAL GREEN (ST. MATTHEW).—It is much to be regretted that the Vestry of this parish did not adopt the excellent recommendation of Dr. Bate that there should be a house-to-house inspection of the whole district during 1882. As the medical officer very properly puts it, 'such an inspection is urgently required to ascertain the condi-

tion of the drainage and water-supply arrangements,' and until it is carried out a large number of serious sanitary defects will doubtless continue to exist. Another matter for regret in Dr. Bate's report is that he has still to include a disinfectant among the sanitary requirements of the parish, and we heartily join with him in expressing a hope 'that the Vestry will shortly see its way to provide this very necessary apparatus.' The general health of the parish did not show much variation with that of the previous twelve months; indeed, the birth- and death-rates were practically the same as in that period, being respectively 41 and 24·1 per 1,000 population. There was a diminution in the zymotic death-rate, which, per 1,000 living, was 4·4, against 5·2, but an increase in the infantile mortality, which, per 1,000 births registered, was 164·7, against 153·5. With regard to the zymotic mortality, the deaths from small-pox, measles, and, to a less degree, diarrhoea and enteric fever, were fewer than in the previous year, but those from scarlet fever and whooping-cough were in excess of the numbers recorded for 1881. Of the 555 deaths referred to the principal zymotic diseases, scarlet fever and whooping-cough together accounted for 361 deaths. In respect of the infantile mortality, 27·3 per cent. of the deaths from all causes were those of children not twelve months old, and more than 50 per cent. those of children who had not attained their fifth year. Dr. Bate fortunately regards his duty of reporting to be not limited to a mere dry elucidation of the health statistics of the year. He discusses with much pains a variety of matters affecting the general sanitary welfare of the metropolis, and gives especially a very remarkable account of the present state of the disused burial-grounds of the parish.

BIRKENHEAD.—'The ordinary sanitary operations,' Mr. Vacher states, 'received unremitting attention' during 1882. The medical officer refers to the fact that the department is not provided with a night inspector, and it is certainly desirable that such an addition should be made to the staff. The vital statistics, though they did not reach the high standard of the previous year, were more favourable than usual. The birth- and death-rates were respectively 36·45 and 20·11 per 1,000. From all the zymotic diseases the rate of mortality was 3·68 per 1,000, and from the principal members of the group 2·9. Whooping-cough, of this class, accounted for the largest number of deaths. 'Fevers' also were attended with more than ordinary fatality. The deaths from diarrhoea were in excess of those for 1881, but within the average. Scarlatina and diphtheria were prevalent throughout the year, and measles particularly so in October and November, but the mortality from these diseases was lower, not only than the average of the previous quinquennium, but even than in 'the typically healthy year 1881.' A large amount of interest always attaches to infantile mortality. In this borough during 1882 the deaths of infants under one year were in the proportion of 144 to every 1,000 births, while 42 per cent. of the total mortality occurred in children not five years old. Mr. Vacher speaks in the highest terms of the usefulness of the compulsory notification of infectious diseases, which is in force in the borough.

BIRMINGHAM.—Sanitary work was carried on energetically in this borough during 1882, but Dr. Hill is not yet able to report an improvement in the condition of the street surfaces, and has again to urge the necessity of a more complete system of scavenging. The want of a Public Abattoir is still felt, and seeing that such an institution, apart from its desirability from a sanitary point of view, would, judging from the experience of other towns, return a very fair profit, it is somewhat surprising that the want has not been supplied long since. The general death-rate, 20·6 per 1,000, was slightly in excess of that for the two preceding years, but, with these exceptions, was the lowest on record. A greater number of cases of small-pox were reported than in any year since 1875. In the year under notice, it was fatal in 17 cases only, com-

174 in 1875, and a decennial average of 125. In the fatality of the disease was no doubt every great measure, to the large extent to which agents of the borough avail themselves of vaccination, fever caused 256 deaths, against an average compared with the fatality of previous years, disease was particularly prevalent, the deaths in 1880 showed a marked diminution. Thus, during the year 1878, 995 deaths were registered, and during 1879, 1,324. It cannot be denied that the hospital has been largely instrumental in bringing about this very appreciable reduction in the number of deaths.

Measles was more than ordinarily destructive, the death-rate had not been so mild in any previous year. The death-rate from fever, 0·21 per 1,000, though slightly higher than for the preceding year, and showing no reduction for 1880, was, with these exceptions, the lowest recorded since 1870. Diarrhoea contributed a larger number of deaths than in 1881—534 out of a total of 1,000 from all diseases of its class—but fewer than the average. Of the total mortality, 20·3 per cent. were due to zymotic diseases. The deaths among children under five years of age, at the rate of 165 to every 1,000 births, and of the total mortality—47·2 per cent.—occurred in children under five. The birth-rate was 36·39 per 1,000. The sanitary work of the borough continues to be well pushed forward.

UNION.—It is obviously most essential that the arrangements of any seaside resort should be such as to attract the attention of the medical officers, and the officials of this district have done well to draw a portion of their attention during 1883 to the improvement of the water supply. Improvements were effected in the system, though there still remain several defects to be remedied, and, in addition, a thorough examination of the water supply, the result of which was satisfactory, since, in the opinion of the medical officers, the salubrity of the locality 'is in no way impaired by the condition of the water supply.' The death-rate from zymotic diseases was 15, and the birth-rate 26·7 per 1,000 of population. The rate of mortality from zymotic diseases was 15, which was higher than it had been in previous years. The increase was due to an excessive prevalence of scarlatina. The severity of the disease may be judged from the fact that of the 30 deaths registered during the year 16 were ascribed to scarlatina. Dr. Lett attributes more than one outbreak to Great Britain, and, to judge from his report, the laxity of the health authorities in the removal and isolation of persons infected with infectious diseases is deserving of censure. On occasions, Dr. Domenichetti had to resort to the isolation of a school, but, nevertheless, he records his opinion that it is inadvisable to close a school whenever a case of an infectious nature makes its appearance, and, of his contention, states that, in one village, scarlatina prevailed extensively, the principle of isolating infected families was carried out with such results that only one death occurred during the year.

The infantile mortality was at the rate of 3·54 per 1,000 population.

BY UNION.—The year 1883 was the tenth anniversary of the appointment of health officers in this district, and the sanitary work accomplished during that period is shown by vital statistics. To this we have already referred on page 553 in the *Sanitary Record*. With regard to the year 1883 itself there is little to remark. Perhaps the most noteworthy feature of the year's history was the increase in the number of deaths from lung diseases among infants and aged persons. As a consequence, the death-rate—15·90 per 1,000—though still low, was higher than in any of the preceding years.

END OLD TOWN.—A large amount of useful sanitary work was done in this district during 1882-83, and there is nothing to refer to specially. At a time

when the housing of the poor is occupying such a large share of public attention, it may not be uninteresting to record Dr. Corner's opinion that the Artisans' and Labourers' Dwellings Act (1868) 'has proved most successful in his district.' In the period under consideration the medical officer reported upon seven houses under this Act. The vital statistics cannot be regarded in an unfavourable light. The deaths, which occurred at the rate of 20·87 per 1,000 population, showed a decrease of 69 compared with the average of the five previous years, and this notwithstanding that there has been a large increase in the population. The infantile mortality, amounting to 28 per cent. of the total deaths, was, it must be admitted, excessive; but this heavy proportion is somewhat discounted when it is considered that the birth-rate was as high as 38·6 per 1,000. Scarlet fever was the most fatal of the chief zymotic diseases, the death-rate from which was 3·23 per 1,000, or, exclusive of diarrhoea, 2·68.

MONMOUTH, RURAL.—The fact that every part of this district was visited during the year by the medical officer, Dr. Willis, and the inspector is of itself a sufficient proof that sanitary matters were by no means neglected in 1883. Two incidents in the year's history are especially worthy of notice. One was a peculiar outbreak of bastard or German measles, which occurred at Lydbrook towards the end of December. As many as 200 children were suffering at one time with this complaint. There is little doubt that the infection was spread by the attendance at the Church School of children from the Ross Rural District, who were sickening with the malady, which was of such an infectious nature that in an extremely short space of time every child in that portion of Lydbrook which is within the Monmouth Rural District had contracted the complaint. Fortunately the disease was of an exceptionally mild type, and the greater number of the patients were confined to their beds for one day only. The second incident was the almost simultaneous sickening and death of three children of a certain family residing in West Dean. The nature of the illness was very obscure; apparently the cases were dysenteric; the children were all imbecile; and on investigation the conclusion arrived at was that they had possibly eaten some poisonous plants in the woods which they frequented. The general death-rate for the year was 17·05. The most noticeable feature with regard to zymotic diseases was the prevalence of scarlet fever and whooping-cough, particularly of the former, which was widespread throughout the district during the year.

NEWINGTON.—Sanitary improvements were steadily carried on in this parish during 1882, but no work was accomplished of sufficient magnitude to warrant special reference to it in these pages. Taken as a whole, the vital statistics did not compare favourably with those of previous years. Dr. Iliff has to record the greatest number of deaths hitherto registered in a single year—viz. 2,704—which were equivalent to a rate of 24·80 per 1,000 population. The increase in the mortality was especially noticeable among the young, 1,333 deaths occurring in children under five years of age. In 716 of these cases death intervened before the completion of the first year. Zymotic diseases were fatal in 626 instances, 117 of which were referable to measles and 240 to whooping-cough, both these disorders being exceptionally prevalent. There is nothing to mention with regard to the remaining zymotic diseases, unless it be that there was a considerable diminution in the mortality from diarrhoea. An outbreak of measles of an extremely malignant type occurred in the Newington Infirmary in May. The deaths in this institution during the year (467 in all) showed, however, a decrease upon the numbers recorded in recent reports. On the other hand, the mortality among the outdoor poor was in excess of that of the two preceding years. As far as this individual class was concerned, small-pox, erysipelas, and insanity were on the decrease, but measles and whooping-cough on the increase.

ROMFORD RURAL.—Taking this district as a whole, its sanitary condition is extremely bad, and it is satisfactory to find that the authority's officials are doing what they can to remedy existing evils. We read with pleasure in Mr. Wright's report for 1883, that an extensive and apparently complete system of sewerage for Ilford, Barkingside, and Chadwell Heath, was in contemplation, and if this scheme be carried out, a step will be taken in the right direction. The general rate of mortality for the year was 16·03 per 1,000, while the death-rate from zymotic diseases alone was 1·3. Diarrhoea was attended with less fatality than in any previous year, but typhoid fever and diphtheria, owing chiefly to imperfect sanitary arrangements, prevailed to a considerable extent. One outbreak of diphtheria was especially illustrative of the connection between the disease and sanitary defects. In this instance two fatal cases occurred in a house where there was internal connection between the sink and the drain, thereby permitting the escape of sewer gas into the house. A recommendation to remedy this arrangement was not acted upon until another case had shown itself, when the requisite alterations were made, with a result that the disease did not again appear. The birth-rate for the year was 34·4 per 1,000.

SAINT GEORGE-IN-THE-EAST.—The health returns of this parish for 1882 will compare favourably with those recorded in many previous years. The chief cause for satisfaction is to be found in the great diminution in the deaths from zymotic diseases, which fell from 215 in 1881 to 153 in 1882—the year under consideration. The decrease was most marked in the deaths from measles and diarrhoea. Only 11 per cent. of the total deaths were attributed to diseases of this order, which is the lowest proportion that Mr. Rygate has yet recorded. There was some increase in the deaths of children under one year of age, as compared with the total deaths at all ages, the percentage being 28·4, against an average of 26·7. Nearly half the entire mortality occurred in children who had not attained five years of age. During the year there were registered 1,929 births and 1,197 deaths. Compared with the average of the ten preceding years, the births showed an increase of 60, and the deaths a decrease of 44. A little more information as to the sanitary progress of the district would have been acceptable.

SALFORD.—In his annual report for 1882, Dr. Tatham has again presented a very comprehensive account of the sanitary condition of this borough. It is a matter for regret that the medical officer should have so repeatedly to urge upon his committee the necessity for action in the matter of providing public abattoirs, and, looking to the benefits which would doubtless accrue to the district from the erection of such institutions, we trust that when Dr. Tatham has next to revert to this subject he will be in a position to state that his frequent appeals on this head have at length met with a response. The vital returns, though not quite so favourable as those of the preceding year, which was an exceptionally healthy one, were highly encouraging. The birth-rate, was identical with that for 1881, 38·8 per 1,000. The death-rate 23·2, was a shade over that for the previous year, but, with this exception, was the lowest on record. It must be a source of no inconsiderable congratulation to Dr. Tatham that he should be enabled to point out that, as compared with the average of the seventeen preceding years, 'the rate of mortality in 1882 was lower by not less than 16 per cent.' The zymotic diseases contributed somewhat under a fifth of the total mortality, or 4·5 deaths per 1,000 population. Of the six principal diseases of this class, the deaths from which were equivalent to only 2·7 per 1,000, against an average of 3·9, measles was the most fatal. This disorder accounted for 157 deaths, or 0·90 per 1,000, compared with an average of 144. Scarlet fever, which usually heads the list, took second place in 1882, with a death-roll of 81, or 0·44 per 1,000, against an average of 200. Small-pox, which had shown itself at the end of the previous year, was discovered in 72 cases, of which 18, or

one-fourth, did not recover. There was a considerable diminution in the fatality from fever, the death-rate in this disease being only 0·34 per 1,000, compared with an average of 0·64. Diarrhoeal diseases were registered 240 deaths, or 1·30 per 1,000, against an average of 322.

STALYBRIDGE.—In his report for 1883, Mr. Dudley speaks in very high terms of the sanitary condition of this borough, which he describes as being 'the most satisfactory.' 'The drains and ash-pits,' he states, 'were looked after, and kept in good order. The water is of the purest kind, and second to none in the kingdom. It is not surprising, therefore, that, in a borough possessing these manifold advantages, there should have been a comparative scarcity of zymotic disease in 1883. The zymotic death-rate, which, on seven occasions during the previous nine years, had exceeded 3 per 1,000, was this year under notice only 1·3. The decrease was striking in the case of whooping-cough, from which complaint not one death resulted, while only 15 deaths were referable to diarrhoeal disease—a number considerably below the average. It is to be observed that the scarlet fever were of an exceptionally severe nature, less than 9, or 1 in 4, of the 34 cases reported, terminating fatally. Comparing the deaths in infants with those registered, the proportion was 128 per 1,000—more favourable ratio than usual. The general mortality during the year was 21·5 per 1,000, the rate being 30·3.

ST. GILES'S.—The year 1882 was marked in this parish among other incidents, by the completion of the Mortuary and Coroner's Court in Goldsmith Street Lane. The ordinary routine of sanitary work was pursued, the inspectors making '11,776 visits and inspections, and serving 1,318 orders on owners of property for the abatement of nuisances and the improvement of premises.' Both the birth- and death-rates—29·7 and 24 per 1,000—were above the district average. Infants died in the proportion of 15 to 100 births, and 41·3 of the total deaths were in children under five years of age. The zymotic death-rate was 3·3 per 1,000. Of the diseases of this class, scarlet fever was by far the most fatal, accounting for 41 deaths, a total of 156. Diphtheria, too, which was widespread all London, was especially disastrous in this district compared with previous years, being credited with 12 deaths, against an average of 4·2. The mortality from the rest of the zymotic disorders was not so high as customary. It is a significant fact that not a single case of typhus was reported. The entire absence of this disease was largely due, in Dr. Lovett's opinion, to the disinfection which has taken place of late in the courts and in Drury Lane, Little Coram Street, and Great Coram Street.

STOURPORT.—In his first annual report—that for 1882—Dr. Masterman expresses his conviction that the dampness of the air, overcrowding, and personal uncleanness, are the principal factors of disease in Stourport; 'the unsanitary habit of the lower and lower-middle class of almost universally sleeping in the flannels they have by day, being an especially active one.' To the humidity of the air Dr. Masterman largely ascribes the undervalence of Bright's disease, and to the same cause, coupled with the extensive use of hard cider, he attributes the frequency of rheumatism. The chief sanitary needs of the town, he states, appear to be drainage, the more extensive use of the Kidderminster water, efficient scavenging paths, and—rather as works of private benevolence than of the Board—a cottage hospital and public wash-house and wash-house. It is gratifying to learn, in Dr. Masterman's report for 1882, that considerable improvement have been effected in the scavenging system, and in the surface drains, though ventilating-pipes are needed at several points, for it is futile to shut in sewer gas; it must be conveyed harmlessly away. The condition

mpton Canal, which passes through Stourport, condemned by Dr. Masterman, who contends action within the town limits should be examined, necessary, thoroughly dredged, and that the many is which open into it should be cut off, though that, in the latter case, the canal 'is more sinned an sinning.' In 1881 the birth-rate was 39·63, death-rate 15·79; in 1882 these rates were respectively 39·93 and 16·09. Enteric fever was introduced district in 1882, and scarlatina, of a mild yet dangerous, was prevalent. The cases of enteric fever did to have originated in a place called Wilden, source of the disease was traced to the polluted a well. In several instances, the fever was helped by overcrowding of a most revolting nature. The cases belonged to the series of secondary origin, stated to Dr. Masterman's mind very grave doubts innocuousness of sewage farms. The health officer probable that part of some cesspool soil, which shot into a field, was carried by the wind in fine fell into the pails used for drinking-water, which lying at the doors of some cottages adjoining the he cases of enteric fever generally pointed to the dangerousness of the disease, as not one of the attendants on the sick was attacked by it.

FORD-UPON-AVON COMBINATION (RURAL).—The most interesting feature in Mr. Fosbroke's report for 1882 is his account of the outbreak of typhoid at Evesham, to which we referred at length on Vol. xiv. The epidemic of typhoid increased of mortality, per 1,000, from zymotic diseases, in fact in which it took place, to 1·1, as compared with the previous year. In Alcester, the corresponding rate was also higher than in 1881, owing to the extra from measles. In Stratford, the rate was 0·8, as against 0·4 for 1881. The general death-rate, per 1,000, of each of the three districts, was, in Stratford, Alcester, 15·8, and in Evesham 13·3. Owing to sub-registrars not having made any returns this year, Mr. Fosbroke was unable to give the several rates, and, what is still more important, particulars of the mortality. It is to be hoped that arrangements made to prevent so serious an omission in future. The usefulness of combining the reports upon the rural and urban districts under his charge, has long been pointed out by Mr. Fosbroke, but his authorities made no report during the year to bring about the desired result. The local officer inveighs at some length on the evils arising from the defective drainage of the district.

FORD.—The sanitary department of this district to have done its work well during 1883. Mr. Partridge states that 'great improvement was made in the drainage and sewerage yards and passages,' and that the drainage of the township was, at the date of his report, complete. Considerable attention was given to the improvement of the water supply. In several cases well water was used, and the public water supply of the town substituted. The birth-rate for the year was 28·65, and the death-rate 15·3 per 1,000 population. The deaths from diseases alone were equal to 1·45 per 1,000 persons. Nearly 30 per cent. of the deaths were in children under five years of age.

FORD UNION.—Both the water supply and the drainage system of this district still continue in the same satisfactory condition. In Mr. Partridge's report for 1882, it is read that in one of the villages, Minchin Lamping, owing to the generosity of a resident, the old sewage gully was improved and extended to the bottom of the field, so that it is high time that the authority took the improvement of the water supply and the drainage of the district seriously in hand. The birth-rate for the year was 26·6, and the death-rate 15·9 per 1,000. The rate was the lowest hitherto recorded, and so, with few exceptions, was the latter. Again, the percentage of deaths from zymotic diseases, 5·2, was more favourable

than in any previous year, 1879 excepted. The infantile mortality represented 10·9 per cent. of the total deaths. It is a matter for regret that 25 per cent. of these deaths should have been referred to 'unknown' causes.

SUNDERLAND (PORT).—Of the 9,010 ships which entered this port during 1883, 2,101 were inspected, and of these 80½ per cent. were found in a sanitary, and 19½ per cent. in an insanitary, state. Some evil was still found to result from the storage of ships' stores in the fore-castles; but, on the other hand, an improvement was noticeable in the sheathing of iron decks. The condition of vessels belonging to this country, of which those of Sunderland bore off the palm, was, in most instances, superior to that of the vessels of other nations, though Mr. Harris speaks in high terms of the manner in which the Danish and Dutch ships are kept. It says much for the officials of this authority that captains of vessels should give their assurance that their ships are more systematically visited in Sunderland than in any other port in England. Although only one case of infectious disease was found during the year on vessels entering the port, the question of hospital accommodation is one which demands immediate attention, the more so since, as Mr. Harris points out, the authority is entirely dependent upon the urban authority (which is itself sadly deficient in this respect) for the means of isolating persons arriving from sea with diseases of an infectious nature. Unfortunately, in consequence of the narrowness of the river, it does not appear practicable, without danger to the public at large, and interference with navigation, to establish a floating hospital. The authority, however, seem to be alive to the importance of the subject, and have passed a resolution with a view to facilitate the provision of suitable accommodation for isolation.

WANDSWORTH.—It is satisfactory to find that the sanitary work carried out in this district annually increases in extent, but there are still several defects of great magnitude which it is of essential importance should be remedied, and to which attention is drawn in the annual report of the health officers for 1882. Among these more serious sanitary defects may be mentioned imperfect scavenging, inefficient sewer ventilation, and, chief of all, impure water supply. With regard to this last subject it is suggested that a supply should be obtained from the chalk strata by means of artesian wells, since 'no amount of filtration can completely remove the large quantity of organic impurity contained in the Thames water.' The vital statistics for the year under report were, with the exception of those for the period immediately preceding, the most favourable on record. The birth- and death-rates were respectively 35·69 and 17·48 per 1,000. This latter rate was 0·32 per 1,000 in excess of that for 1881, owing to a greater fatality from epidemic diseases, but 1·62 per 1,000 below the decennial average. The infantile mortality was equivalent to 137 deaths per 1,000 births—a more favourable proportion than usual. The mortality in children under ten increased, however, during the year, representing 51·3 per cent. of all deaths, against an average of 49·7. The deaths from the seven principal zymotic diseases—615 in number, or 43 less than the average—occasioned 15·9 per cent. of the total mortality, and 2·79 deaths per 1,000 population. Whooping-cough was the most fatal of these disorders, followed by scarlatina, diarrhoea, and measles. The deaths from whooping-cough, scarlatina, and measles were respectively 26, 5, and 23 above the average, but those from diarrhoea were 68 below the average. Diphtheria was particularly fatal in Putney, where it caused 29 deaths out of the 51 registered for the whole district.

WEST SUSSEX.—Dr. Kelly has treated the vital statistics of this district very exhaustively in his report for 1882. The year's history, however, presents nothing of extraordinary interest. The birth-rate, 30·9 per 1,000, differed scarcely at all from the rates recorded in previous years. As usual, there was an excess of male over female

births, the respective numbers being 1,592 and 1,381. It is worthy of note that, during the period 1876-1882, the births were twice as numerous as the deaths. The general death-rate was 14.3 per 1,000, a trifle above that of the previous year, but, with this exception, the lowest recorded. The infantile mortality, in proportion to every 1,000 children born, was 90, showing a decrease on the average of 3 per 1,000. The zymotic diseases accounted for 164 deaths out of a total of 1,376, or 1.7 deaths per 1,000 population. To whooping-cough 53 deaths were registered; to diphtheria, 35; to diarrhoea, 19; to measles, 16; and to scarlatina, 15.

WITHINGTON.—The officials of this district appear to have done their work very thoroughly in 1883. Among other items, it is pleasing to find that 'the number of houses supplied with water from springs and pumps is steadily diminishing.' It is worthy of note that the magistrates decided that, although the keeping of pigs may be proved to be a nuisance, the Board have no power to compel the owners of these pigs to discontinue keeping them. Dr. Raillon points out that it will probably become necessary to establish a by-law limiting the distance from dwelling-houses at which pigs may be kept. The vital statistics for the year are satisfactory, the death-rate, in spite of an increased birth-rate—31 per 1,000—being only 13.4 per 1,000. Zymotic diseases showed a death-rate of 1.4 per 1,000. Of disorders of this class, scarlet fever was exceptionally prevalent, more so than in any preceding year. With reference to the infantile mortality, it may be mentioned that fully one-fourth of the total deaths occurred in children under five years of age, nearly 50 per cent. of whom died before they had completed one year of existence.

WORSBROUGH.—It is gratifying to read in Dr. Sadler's report for 1883 that the water-supply of this township is 'unexceptionable,' and that the system of sewerage and sewage disposal, which was considerably improved during the year, is 'complete for all its more important portions.' The scavenging of the district, however, is very imperfectly carried out and requires serious attention. Dr. Sadler has done wisely in adverting betimes to the condition of the burial-grounds of the township, which, in his opinion, is such that it will be necessary to provide further accommodation in this direction within the next two years. The birth and death-rates for 1883 were respectively 39.40 and 17.77 per 1,000 population. The infantile mortality was in the ratio of 162 deaths to every 1,000 births, and over 56 per cent. of the total deaths occurred in children not five years old. There only remains to add that zymotic diseases were accredited with 22 deaths out of an aggregate of 150.

NEW INVENTIONS.

THE BOLANACHI COMPANY'S NEW CHOCOLATE.

IN this country chocolate is not drunk to the same extent as on the Continent, although the cacao bean is much consumed in the form of chocolate confectionery. The cacao bean, when ground and mixed with certain ingredients, forms a large percentage of the beverages in use in England, particularly amongst the poorer classes, who like it for its palatability, and also because it is more nourishing than tea or coffee. That cocoa is, as a matter of fact, looked upon with favour by all classes, is shown by the many preparations of it that have been introduced, at prices to suit all sections of society. Some preparations are recommended because the butter has been extracted, and others because it is retained. Cocoa, however, is a beverage that may be sold pure at a price within the means of the working classes, and yet, because it is one of the easiest things possible to adulterate, an undue proportion of starch and flour, if not more unwholesome ingredients,

is often mixed with it, so as to reduce its nutritive properties to a low standard. These reflections have been suggested by a recent visit to Bolanachi's Chocolate Company's Manufactory, at Spa Road, Bermondsey, where chocolate is being made on an extensive scale by an entirely new and simple process, the invention of Mr. Bolanachi, who has devoted many years of thought and experiment to the subject. These experiments have resulted in his being enabled to offer the public a pure compound of delightful flavour at a price that brings it within the reach of all classes. Chocolate is the name given to a compound composed of a certain portion of the cacao bean, sugar, and some kind of starchy matter, but Mr. Bolanachi discards the latter altogether, and instead of the sugar he uses a syrupy honey-like extract, obtained from the Ceretonia bean (*Ceretonia siliqua*), popularly known as St. John's bread, and of this and the cacao bean in its pure state the new chocolate is exclusively made. The inventor, who is of Turkish nationality, and whose family are extensive landed proprietors in the Greek Archipelago, some years since conceived the idea that the Ceretonia bean might be put to more important uses than those for which it is generally employed, and commenced experiments with a view to extract its rich saccharine matter; of which the chocolate factory in the Spa Road is the practical outcome. A short description of the *modus operandi* will demonstrate the absolute purity of the ingredients and the exact constituents of 'Chocolate Bolanachi.' The cacao bean when roasted is relieved of the husk, which is not used at all, then roasted, ground, and mixed or worked by machinery, with the whole of its butter retained, and so formed into what is technically called cocoa cake. The ceretonia beans, of which only the finest qualities are used, coming from Candia and Cyprus, are also ground, and then carried by covered 'shoots' to a range of large circular vessels, where it is prepared ready for evaporation, the liquor passing down into a large receptacle, and by means of a steam pump it is eventually carried to a steam-jacketed pan, where it is evaporated, leaving only the rich, honey-like extract before named. Both ingredients are now ready for combination. Fortyparts of the cocoa cake and sixty of the honey syrup are then placed in a machine of ingenious construction, where they are thoroughly mixed and incorporated, and eventually withdrawn in the form of a thick paste. It is then put into tins holding one pound each, covered and labelled, and packed in boxes ready for delivery. All the processes, which are very simple, and, except the filtration, comparatively rapid; are effected by machinery, and the hand does not come in contact with the ingredients at any stage. But the most remarkable effect of the combination of the two substances is the change effected as regards the cocoa butter. Were a portion of this cocoa cake, with all its butter in it, to be eaten, the probability is that the strongest digestion would not assimilate it comfortably, and a large percentage of people could not take it at all, but by its admixture with the syrup of the ceretonia bean this state of things is changed. Though still present, the butter is robbed of its objectionable properties, and when mixed with water, not a particle of fat is visible to the eye or perceptible to the palate. It is thus in the form of chocolate paste that this product is commercially introduced, and for the reasons that Mr. Bolanachi has been desirous to introduce it as a popular beverage, and at a price within the means of the poorer classes. As the two ingredients are, so to speak, 'cooked' in the process of preparation, nothing further is required than to take a spoonful of the chocolate and mix it in a breakfast cup with boiling water, where a delicious infusion is obtained, and unless the individual who is to drink it have a very 'sweet tooth,' no addition of sugar is required. If made with milk instead of water a much richer beverage is obtained; but in either case this chocolate is equal in flavour to the finest preparation of the kind obtainable. This paste is sold retail in one pound tins at one shilling, and although a little

price than some of the trash sold even as ordinary in its purity and sustaining properties are taken deration, it is really much cheaper. Although as introduced as a paste the chocolate cake will soon and arrangements are now in progress for making is kinds of chocolate confectionery so much liked blic. It is affirmed that the weakest digestion ilate this chocolate, and from trials the writer has th it he is disposed to support the assertion. advantage resulting from the manufacture (to the is that a good food for cattle is found in the , which can be supplied at a low rate. Mr. i has called in the valuable aid of Professor who has visited the factory and made himself d with all the processes, taking his samples for from bulk. The analysis appended is so satis- at there can be no reluctance in recommending late, particularly to those who are responsible for being of the poorer classes, or who are concerned : diet. Mr. W. W. Parkinson, the master of the St. Workhouse of the St. Olave's Union, South- s made experiments with one cwt. of the Bola- colate, and finds that, while yielding a much titious beverage than those now in use, the cost is atther less.

alysis is as follows :—

(Copy).

is of Bolanachi's chocolate paste, by PROFESSOR O, &c., &c.: author of 'Chemistry: General, and Pharmaceutical.'

chi's chocolate paste I have seen made on a large re factory. The best quality was prepared from s of cocoa, and not ordinary sugar, &c., as usual, parts of sweet clear honey-like extract of the vn *ceratonia siliqua* or 'St. John's bread.' of these taken from bulk by me yielded :

moisture	1'61	
cocoa butter	21'10	
albuminoid matter	6'55	
leobromine.....	'71	
phosphate of potassium, &c. ...	1'32	
arch, gum, cellulose, &c.....	8'71	40
nia extract :		
moisture	14'09	
albuminoid matter	1'47	
sugar.....	34'80	
extrin, &c.	9'42	
phosphate of potassium, &c. ...	'22	60
		100

June 23, 1884.

JOHN ATTFIELD.

A DOMESTIC CONUNDRUM.

the above title the City of London Sanitary ion, of Cannon Street, E.C., have patented a new



(of which an illustration is appended), and which

is further stated to be 'without a bottom, without a lid, and without a spout.' As the reader will gather from the drawing, it is intended to boil water rapidly, which from its shape it is bound to accomplish. It will be observed that it is formed with a large hollow chamber underneath, in which the fire or heat is concentrated, and the only orifice through which the water is poured in or withdrawn is the one on the right-hand side. It may be questioned whether the inventor, Mr. Barron, the manager of the company, has correctly described the kettle as being without a spout, neither do we desire or request a discussion of 'what is a spout,' but it can be entirely recommended as a valuable addition to any home, and for many purposes when a small supply of hot water is required quickly. It is made in various sizes. It matters not whether the applied heat be that of a fire, a gas stove, or a simple gas burner, as the great amount of caloric collected in the hollow chamber causes the boiling point to be reached in an incredibly short space of time.

LAW REPORTS.

JUDICIAL COMMITTEE OF THE PRIVY COUNCIL.

(Present.—SIR BARNES PEACOCK, SIR ROBERT COLLIER, and SIR ARTHUR HOBHOUSE.)

Bischof's Patent.

THIS was a petition for the prolongation of letters-patent granted on Sept. 19, 1870, for a term of fourteen years, to Mr. Gustav Bischof, jun., for the invention of 'improvements in the means employed for the purification of water.'

The invention related to the use of spongy iron for purifying water for domestic purposes, and depriving sewage of its obnoxious and dangerous properties. Spongy iron has been proved to possess a strong and lasting action in separating or destroying and rendering innocuous by chemical agency various objectionable matters occurring in water and sewage; and of still greater importance is the physiological purification effected by the material—that is to say, the destruction by it of low forms of organic life occurring in water and sewage. It has been proved that no degree of dilution and no natural filtration or ordinary artificial filtration, such as through sand, however efficient it may be, affords any such guarantee; and it had been applied with very great and most marked practical success at the military stations of Fort George, in Scotland, Shoburness, and elsewhere. The petitioners, Mr. Bischof and others, had expended large sums of money and devoted great pains and trouble in endeavouring to introduce the invention to the public and bring it to use. They had endeavoured to obtain its employment by water companies in London, but owing to the uncertainty which had prevailed since 1878 as to the position of the water companies in regard to proposed legislation on their rights, the companies had been unwilling to embark new capital in adopting the invention. The only town in which the invention had been applied to waterworks was Antwerp, and it had been perfectly successful. In these circumstances, the chief application of the invention had been for the purpose of the manufacture of domestic filters. The utility of the invention had been generally acknowledged, and domestic spongy iron filters had been introduced into the various Government departments, and were beginning to be generally used. In these circumstances, the petitioners asked to have the patent extended, in order that they might receive a fair reimbursement and remuneration commensurate with the great public value and importance of the invention.

Their lordships entertained no doubt that the invention which was the subject-matter of the patent was a very useful and meritorious one, and they thought that as far as that went it should be renewed, unless the patentee had received adequate remuneration. As to that point, the

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accounts had been proved, and the Attorney-General did not object to them. Their lordships were of opinion, upon those accounts, that so far from the patentee having made any profit, he had sustained a loss, and they thought that they ought to advise Her Majesty to renew the patent. In the case of Spencer's patent, it was extended for seven years, and, following that precedent, their lordships would advise her Majesty to extend Bischof's patent for seven years.

ADULTERATION OF SWISS MILK.

Messrs. J. C. Flack & Sons, of 484 Bethnal Green Road, appeared at Worship Street to a summons under the sixth section of the Adulteration Act for having sold an article of food, to wit condensed milk, containing only one quarter of the usual proportion of butter fat. Mr. Lapworth, a sanitary inspector of Bethnal Green parish, proved purchasing at the shop of the defendants a tin of condensed milk, which was submitted to the parochial analyst. His certificate was now put in, and declared that the condensed milk in question contained 'only one quarter of the usual proportion of butter fat, the original milk was reduced in bulk from 4.96 parts to one, and had 26.07 per cent. of cane sugar added. Originally it contained only 0.52 per cent. of butter fat.' It was mentioned that although proceedings in connection with condensed milk had been taken by authorities in country towns, this was the first action of the kind in London. The defence was that the defendants were relieved from liability under the Act by the 25th section, which said that such exception should take place if the article in question was of the same nature, substance, and quality as purchased by the seller; that he had no reason to believe it was otherwise, and that he sold it in the same state as supplied, and with a written warranty. There was upon a label pasted to the tin the following words: 'The company guarantees this to be simply pure milk obtained from cows fed in the valley of Switzerland.' It was contended that this warranty, which was affixed to the tin, was placed by the original merchants; but the defendants were unable to state the actual name of the company who supplied them, through their agent. The defendants also proved that the tins sold were not tampered with before being retailed. The defendants did not contest the analysis. Mr. Hannay said he was inclined to believe the label was not a warranty within the meaning of the Act, and the only protection for retailers would be to procure a written warranty from the firm from whom they obtained their supplies. In the present case, no one could say who 'the company' guaranteeing was. The Act certainly intended that some one should be liable in these cases, and although he did not think the defendants were morally guilty, they would have to bear the responsibility. He imposed a nominal penalty of 1s., with 23s. costs. The defendants said they had stopped the sale of the brand in question.

THE ABSTRACTION OF CREAM FROM MILK.

An important case to milk dealers was decided at the last Birmingham Quarter Sessions. Ernest Bomford, a farmer, appealed against a conviction by two of the Birmingham borough justices for abstracting from milk sold by him 20 per cent. of cream, and not disclosing the fact. The proceedings were taken under the third section of the Food and Drugs Adulteration Amendment Act, of 1875, which makes it illegal for any person to abstract any food or sell any article adulterated without making it known. The analysis of the sample taken by the inspector showed the amount of fat to be 2.39 per cent., and of solids, not fat, 9.01 per cent. The standard taken by the analyst as the basis of his calculations as to the purity or otherwise of milk was 3 per cent. for fat and 9 per cent. for other solids. The defence was that the milk was pure as it came from the cow when it was delivered to the railway people, and that the adulteration, if any, was effected during transit and between the time of the delivery of the milk to the railway authorities and its reaching Snow Hill Station at Birmingham, where the

sample was taken upon which the proceedings were based. It was therefore a matter beyond the appellant's knowledge, and as such impossible for him to disclose. It was also stated that the railway company would not allow the churns to be locked unless they had a duplicate key. The Assistant Recorder, in giving judgment, stated he had no doubt the cream had been abstracted from the milk, while he was satisfied that it could not have been done previous to the milk being sent to the railway. It would be unwarrantable to hold the appellant responsible for failing to disclose a fact of which he could not possibly have any knowledge, and he quashed the conviction, with costs.

UNWHOLESOME FOOD.—TECHNICAL DEFEAT OF JUSTICE.

At the Darlington Borough Police Court, on the 24th ult., Richard Iddison, a butcher of Park Street, was charged by Mr. T. A. Atkinson, Nuisance Inspector of that borough, with exposing for sale a quantity of diseased meat. The Inspector stated that on the 7th ult. Iddison had about 15½ stones of meat, liver, kidneys, &c., which from its appearance he suspected to be unsound. Dr. Lawrence condemned the meat and had it destroyed. Mr. G. Maw, who appeared for the defence, took the objection that the appointment of Mr. Atkinson as Inspector of Nuisances had not been proved. The Bench dismissed the case, and a charge against J. Button, Park Street, was also dismissed on the same contention. This miscarriage of justice should be carefully noted by sanitary inspectors.

SMOKE ABATEMENT.

Messrs. Maybury, Marston, & Sharpe, hoop iron manufacturers, Brindle Heath, Pendleton, have been summoned to the Salford Police-court for permitting a smoke nuisance at their works, and fined 5l. and costs.

THE TIPPING OF REFUSE.

Action against the Darwen Corporation.

In the Chancery Court of Lancashire, at Manchester, before Vice-Chancellor Bristowe, *George Walsh v. The Mayor and Corporation of Over Darwen*, in which plaintiff sought for an injunction to restrain the defendants from continuing the tipping of refuse on land adjoining his house, has been before the Court. One of the plaintiff's witnesses, Mr. Beevers, of Preston, having stated that the Corporation had made arrangements for bringing the refuse complained of into the ravine near plaintiff's house by an entrance furthest removed from it instead of passing it, which would abate the nuisance to a considerable extent, the Vice-Chancellor suggested whether an arrangement might not be made between the parties. It was ultimately arranged that the matter should stand over until October next, the Darwen Corporation in the meantime to desist from conveying refuse past the plaintiff's house, it being understood that this was to be done without prejudice as to costs.

BRIEF NOTES OF USEFUL CASES.

HIGHWAY.

1883. *Carter v. St. Giles's B.W.* Application for Injunction to restrain the narrowing of a cartway by abstracting space for formation of a footway—Application refused, it being shown that a footway was desirable, and that defendants had not exceeded their powers. (*Times*, June 23, 1883.)

STREET IMPROVEMENTS.

1883. *Gard v. Commissioners of Sewers.* Local Act—Powers to take premises for widening a street restricted—*Thomas v. Daw and Galloway v. London* distinguished. (18 L.J., N. of C., 107; 49 L.J., 325.)

SCAVENGING.

1883. *Goodacre v. Watson.* Injunction granted at suit of neighbours to restrain land from being used for deposit of house refuse, before being built upon. *Per Fry, J.*—

'It was nothing short of horrible to think that persons should seek to place foul vegetable and animal matter as foundations for buildings, and then come into court to defend such conduct.' (*Times*, Feb. 23, 1883.)

GIFT TO CORPORATION.

1883. *Hewitt's Estate, In re.* Gift to Corporation of money, the interest to be applied in 'acts of hospitality or charity,' held void for uncertainty. (53 L.J., Ch., 132; p. 73 [*Hewitt v. Hudspeth*] 49 L.T., 587.)

RATING OF EMPTY HOUSE.

1883. *Hicks v. Dunstable Overseers.* Owner of empty house held rateable when he had put in a caretaker who made some money at a weekly rent out of the herbage. (47 J.P., 821.)

HIGHWAY.

1883. *Illingworth v. Bulmer East Highway Board.* 25 & 26 Vict., c. 61, § 18—Neglect to repair highway—Grounds on which an appeal to sessions might be had against an Order of Justices. (52 L.J., Q.B.D., 680; 48 J.P., 37.)

WHARF.

1883. *Lucas v. Sculcoates Assessment Committee.* Rating of wharf used by contractors engaged in making a railway. (At Q. Sess.) (47 J.P., 761.)

SEWER.

1883. *Metropolitan Board of Works v. Willesden Local Board.* Rights of local authorities just outside the metropolis to use of metropolitan sewers. (*Times*, Dec. 4, 1883.)

POOR RATE.

1883. *Peterborough Corporation v. Wiltshorpe Overseers.* An appeal lies to the Court of Appeal from a decision of the Queen's Bench on a case stated in an appeal against a Poor Rate. (53 L.J., M.C., 33; L.R., 12 Q.B.D., 1.)

COMPENSATION.

1883. *Pearsall v. Brierley Hill Local Board.* Public Health Act, 1875, § 308. A person claiming compensation may insist on amount being decided by arbitration, even though a dispute exists as to the liability. A valid decision as to liability is not a condition precedent to arbitration as to amount. (52 L.J., Q.B.D., 529; 49 L.T., 486; 47 J.P., 628.)

ROAD REPAIR.

1883. *Reg. v. Cheshire Jf.* Road out of repair—Dispute as to way being public or private—Quarter Sessions held bound to order an Indictment notwithstanding *Reg. v. Farrar*. (47 J.P., 788.)

DEFAULT AS TO SEWERAGE.

1884. *Reg. v. Cheshunt L. B.* Default of Board for several years to provide sewerage—*Mandamus* issued at instance of Local Government Board under 'Public Health Act, 1875,' § 299. (*Times*, April 3, 1884.)

RATING OF DOCKS.

1883. *Poplar Union v. East India Dock Co.* Annual profits steadily falling off—How changes in annual value to be dealt with for valuation purposes. (Metrop., 48 J.P., 116.)

SEWER EXPENSES.

1883. *Salford Corporation v. Clowes.* On proof that a road was an 'Occupation road' to two farms, adjacent owners held liable for paving and sewerage. (*Times*, March 23, 1883.)

RATES.

1883. *Yates v. Chorlton-on-Medlock Union.* Caretaker put into empty house with duty of showing it to intending tenants, and to go out on request, held not a rateable occupier, only owner's servant. (48 L.T., 873; 47 J.P., 630.)

REVIEWS.

Nineteen Centuries of Drink in England. By RICHARD VALPY FRENCH, D.C.L., LL.D., F.S.A. London: Longmans, Green, & Co. 1884.

THE author of this interesting book has evidently written it with the design to elucidate the part which intoxicating drink has played in the individual and national life of the English people. With this object he has conducted an elaborate inquiry into the various kinds of intoxicants in common use at different periods, into our drinking customs and usages, and into our drinking vessels, as well as into the many legislative and ecclesiastical attempts in our history to limit alcoholic indulgence. The ancient Britons led a generally abstinent life, but upon extraordinary occasions they drank to excess, and almost invariably quarrelled when in their cups. Before the Roman conquest wine was unknown in Britain, *metheglin* or mead having been the only intoxicant of which we have any record. After the introduction of agriculture, ale and cider became common drinks. The Romans introduced wine; and repeated, though practically unsuccessful, attempts were made for centuries to cultivate the grape for the manufacture of wine in England. To the Romans we also owe signboards. For ages the first sign of an inn was a bush; hence the proverb, 'Good wine needs no bush.' To the Roman influence, too, we are indebted for our national custom of toast-drinking, several classical authors abounding in descriptions of Roman toasting formalities. From these invaders our progenitors adopted habits of excess, all ranks and conditions of men becoming rapidly intemperate and luxurious in their mode of life. Though not a new plant of Saxon setting, intoxication increased so greatly during the Saxon period that even the clergy fell into the too fashionable vice, so much so that bishops themselves drank to excess and amused themselves by compelling others to drink till they were intoxicated. During this period the chief beverages were wine, mead, ale, cider, and piment. In the eighth century taverns or ale-houses had been established. In the Danish period drinking became still more widespread, a special feature of this period having been voluntary associations, *sodalitates*, designed as much for conviviality as for spiritual benefit. The battle of Hastings was lost through the debauchery of Harold's troops. The author describes the Plantagenet reign as the Light Wine period, a variety of light wines having at that time been introduced into common use, though he tells us that no improvement in public morals followed. He traces English drinking habits to the present day, and contends that, till recently, our national shortcoming had shown little appearance of diminution. He admits that there are now symptoms of a change for the better, quoting Isaac Disraeli's prediction of a return to sobriety. Dr. French refers to the various drastic endeavours both by Church and State to lessen the evil, but is unable to point to any marked amelioration from either ecclesiastical or legislative action. Contrary to what might have been expected from so noted an advocate of total abstinence, he seems to foreshadow a time when man shall forbear from abusing 'the gifts which a gracious Father has given his children to enjoy.' By this, we presume, he means that men shall learn to use without abusing strong drink, to drink moderately without going on to intoxication. We fear that this dream has little chance of realisation. So long as intoxicating drinks continue to be made as strongly alcoholic as most of them at present are, and so long as human nature remains fallible, we fear that intemperance will not cease in the land. As the public health has so severely suffered from the excessive use of intoxicants in the past, so it will in the future, unless either abstinence becomes more diffused through the population, or, as might easily be done, beverages with a lower alcoholic strength come into fashion. The book, which is tastefully got up, contains much valuable information.

Our Duty in Regard to Health. By G. V. POORE, M.D., F.R.C.P. International Health Exhibition Handbooks. Clowes & Sons, London.

WE have read through this little book with feelings of great interest. It is cleverly written and contains much that is good, though sometimes open to the venial charge of being in some respects unpractical. A main feature of it is an attack on the water-carriage of excreta, a sweeping condemnation of sewers and sewerage under all circumstances. Dr. Poore hardly seems adequately to distinguish between aggregation of population and overcrowding. Aggregation is a necessary concomitant of the growth of modern industries, commerce, and civilisation, and is not in itself incompatible with a high state of health. By overcrowding we understand such a herding together of the masses amid sanitary surroundings of a low order as is incompatible with health and morality.

However desirable it might be that every rood of land should maintain its man, as Goldsmith sang, or that every house should have a quarter of an acre of garden-ground wherein to dispose of the excreta, we cannot hope or ask for the return of such a state of society, and it is of no use 'crying for the moon.' We entirely agree with Dr. Poore in deprecating the introduction of sewers into country towns where earth-closets for the careful and pails for the careless would suffice for the reception and facilitate the utilisation of the excreta; but could such a scheme be carried out in London, or could Birmingham, Manchester, Liverpool, and Glasgow be now broken up and their houses be distributed over entire counties? If not, what other than sewerage and water-carriage can be pointed to as the best, the quickest, cheapest, and most cleanly way of conveying excreta away from the precincts of the houses? That the discharge of the sewage as such into rivers can no longer be tolerated we feel strongly, but since sewerage is a necessity we must on the one hand insist on the complete disconnection of every house from the sewer, and on the other on the treatment of the sewage by irrigation or chemical process, so as to render it sufficiently pure to be passed into large streams, where it may be subjected to the oxidising action of running water.

Again, is it practical to tell the Londoner, even if he enjoy his quarter of an acre of tennis lawn and flower garden, to deposit or bury his excrement therein. Surely, then, to tax water-closets would be cruel to the poor man and unjust to the rich. Dr. Poore wisely and emphatically points out the dangers of surface wells, or even of deep ones under certain circumstances; but it is another thing to insist on the exclusive use of rain and river water, since the latter is not always within reach, and the former, besides being uncertain in amount, requires precautions for its storage, which cannot be counted on in the cottages of the labouring poor to prevent its becoming fouler than the worst well or ditch.

The author's strictures on the practice of crowding one's guests in dining-rooms or saloons with less cubic space than is allowed to convicts, and on the abuse of dustbins, are worthy of the highest commendation. Indeed, the writer of this has himself dispensed with the dustbin altogether, finding the fowls, the kitchen fire, and the garden soil together capable of disposing of every kind of refuse, and realising the author's epigram that the dustman's call for the contents of a single pail, containing only broken glass and dry bones, need not take more time than the postman's visit.

As regards the disposal of the dead, Dr. Poore is in favour of interment versus cremation.

In conclusion, we can only repeat that the advice contained in this little book is applicable enough to the occupier of a country house or cottage, but that as regards the denizen of our existing large towns it can hardly be said to face the hard facts of the case, or realise the difficulties with which the practical sanitarian has to deal. None the less it is an intelligent, original, very readable,

and outspoken treatise, full of sound doctrine vividly enforced.

Where to take a Holiday: Reports on some Home and Foreign Health-Resorts, being the Holiday Number of the LONDON MEDICAL RECORD. London: Smith, Elder, & Co. 1884.

IN the SANITARY RECORD of August 15, 1883, we reviewed at length the first number of 'Where to take a Holiday,' which had then been just issued. The publication thus early in the present summer of this second number will be welcomed by many readers, as in many particulars it is a considerable improvement upon its predecessor. There seems in the present instance to be scarcely the same necessity to review the whole work in like detail as in August last; but, briefly, it may be described as a collection of papers on holiday topics by medical men, each of whom has evidently made himself practically acquainted with the subject on which he writes. They approach the question of 'Where to take a Holiday' from the physician's point of view, and show in what maladies and conditions of ill-health the various health-resorts in and within easy distance of the British Isles may be expected to be of service to invalids. There are many points noticed in the various papers that will be of service to holiday seekers in general, but by those who travel for health's sake, and by their medical attendants who, in all likelihood, are called to assist at the family council when the momentous question of 'where to go' is decided, these pages will be found particularly useful.

The following is a short summary of the papers herein published. The first is entitled 'The Spas of Great Britain,' and is from the pen of Inspector-General Macpherson. In it he classifies the spas under eight heads, and notices in detail the chief localities and towns at which the various kinds of waters are found, including Cheltenham, Leamington, Scarborough, Droitwich, Tunbridge Wells, Harrogate, Buxton, Matlock, and Bath in England, Llandrindod in Wales, Strathpeffer, Moffat, Bridge of Allan and other places in Scotland, and Lindisvarna and other localities in Ireland. Dr. Hermann Weber is the author of the second paper, which describes 'Continental Climatic Resorts in Summer' in a brief space, which all will do well to read who are seeking for information on this wide question. The accomplished author describes these resorts in the two natural divisions of seaside places and inland climates of the Continent. The choice of English health-resorts is described in the third paper, by Dr. Symes Thompson, under four heads: conditions which determine choice of change, health-resorts in general, seaside health-resorts, and inland health-resorts. Dr. C. Parsons contributes judicious remarks on sea-bathing in the next article. Dr. Burney Yeo describes a not too well-known holiday locality in an article on Pyrenean and adjacent Summer Health-Resorts, from which those who are seeking for fresh lands for their holiday-feet to conquer may gain much instruction. Dr. Thin shows how summer holidays at sea may be enjoyed in cruises in the many lines of steamers which take their departure from British shores. Lastly, Dr. Vintras, in continuation of his paper of last year on some seaside resorts on the French coast, notices the principal sea-bathing places lying between the mouths of the Seine and Orne, including Honfleur, Villerville, Trouville, Deauville, Villers-sur-Mer, Caen, and other places. The next paper is a lengthy one on some half hundred of the chief English and foreign health-resorts, in which detailed authoritative particulars respecting their climate, water-supply, health statistics, lodging accommodation, and general resources are given. Hints to travellers as to climate, exercise, and recreation, drinking, and food, and clothing; reviews of recent works cognate to the subject-matter of this serial; and a notice of some useful preparations for travellers, conclude the work. Altogether, it will be found that this publication, the

price of which is only one shilling, combines in a handy form a very large amount of information useful to the multitudinous seekers after health, who may be desirous of deciding with discretion where to take a holiday.

SANITARY JOTTINGS.

SANITARY.

NEW HOSPITAL FOR INFECTIOUS DISEASES AT SUNDERLAND.—The Sunderland Town Council have agreed to purchase a site of land of about 12 acres in extent, at an estimated cost of 5,000*l.* for the purpose of erecting a hospital for infectious diseases. The site was chosen with strong approval from Dr. Mordley Douglas and the majority of the Health Committee, although an alternative site was offered at a much cheaper rate.

DR. A. J. MARTIN, in his pamphlet on the relation of Medical Science to Public Health (*le rôle du médecin en hygiène publique*) shows the necessity of a sanitary administration, and describes the sanitary organisation of every country in Europe except France.

THE inlet ventilation and warming of the new Church of St. Peter's, Limehouse, built by Mr. Ewan Christian, 8A Whitehall, for the Ecclesiastical Commissioners, has been undertaken by the *Æolus Waterspray Company*. The ventilating arrangements, so far as regards the extraction of the vitiated air, are simple enough, namely, three openings in the wood ceiling, protected with wood flaps, which can be raised or lowered at pleasure. These openings communicate with louvred openings in the gables. For the inlets and warming two *Æolus Waterspray Ventilators* of the Horseshoe pattern, furnished with heating stoves, are fixed in the vestibule. The stoves are coated with silicate cotton composition, and the whole apparatus is enclosed in ornamental wooden casing. The heating is effected by gas, which burns around a number of tubes in each stove, heating them to an intense degree, and through these the air, after being washed and purified, is passed into the Church. The gas fumes are carried off by a distinct flue. All that is seen inside the building are two circular openings, 16 inches in diameter, and 8 feet above the level of the floor; each instrument delivers 130,000 cubic feet per hour of purified fresh air, heated to a temperature of 140°; or 80,000 cubic feet of cold fresh air, at a temperature of 17° below the external temperature in the shade in summer time. The consumption of water in each instrument is 80 gallons per hour, and of gas 45 feet per hour. It is calculated that by means of these instruments the temperature of the Church in winter can be raised to 60° in less than two hours. The whole apparatus is perfectly under control, and can be stopped or set going at a moment's notice. The cost of applying this system is much below the ordinary charges for heating apparatus, and the working expenses nominal. The vestibule is to be used as a Sunday school-room, and to be partitioned off into class-rooms by curtains. The radiated heat from the stoves will suffice to warm this portion of the Church. At the eastern end of the south side aisle, in the organ chamber, the *Æolus Company* have fixed one of their very elegant ventilating gas stoves. These are in principle the same as those attached to the waterspray ventilators, but are minus the waterspray. The stove is connected at the base with the outer air by an opening through the wall. This can be used as an ordinary air inlet, cold in summer and warm in winter. Another of these stoves warms and supplies fresh air to the 'stry. The *Æolus Waterspray Company* are, we are informed, applying their system of ventilation to the composing room of the *Daily Telegraph*, the largest in London, and to the foundry, composing, printing rooms, and general offices of the new premises of the *Daily News*, Bouverie Street.

THE HOUSING OF THE POOR.

*'How best to help the slender store,
How mend the dwellings of the poor?'*

THE REV. S. A. BARNETT ON THE DWELLINGS QUESTION.—In his Annual Pastoral Address and Report for the year 1883-84, the Rev. S. A. Barnett, the vicar of St. Jude's, Whitechapel, thus speaks on this question:—Again, there is nothing but complaints to record as to the state of the dwellings. During the whole year acres of ground, cleared by the Metropolitan Board of Works so as to provide houses for the people, have remained barren as a desert. Some portion was put up to auction last summer and sold, but as yet there is no sign of building. Legal difficulties can hardly be the reason for delay, inasmuch as two large public-houses have been erected on the same site. Want of purchasers cannot either be urged, inasmuch as the East London Dwellings Company, of the formation of which I spoke last year, has been at all times ready to purchase. Because the Metropolitan Board of Works have other cares than the interests of the people, the hopes of the last ten years still remain only hopes, but some day there will be houses in which labourers may live under healthy conditions and friendly management, and there will be a common lodging-house where, as in a hotel, men may find a place in which to live and sleep free from the most degrading associations. The East London Dwellings Company, failing to get the site in Goulston Street, have bought a site at the back of the Royal Mint, on which houses for labourers will be erected, and where I hope the management will be entrusted to lady collectors. The houses include now St. George's House, a fine block which has been completed during the year, and which provides accommodation for thirty-eight families. The talk about the housing of the poor has given us neither facts nor light. That some of the poor live huddled in rooms which through neglect have become dirty, draughty, and rotten, has long been a recognised fact. That many poor families must live in single rooms is a necessity when society demands cheap luxuries, and the average wage is 1*l.* a week, irregularly paid. All that has been told has been long known, and no royal road to the remedy of evil has been discovered. Houses provided at reduced rents would reduce wages, and closer inspection would lead to more clever evasions. There is no remedy till the habits of the people are changed. The rich—be they landlords or employers—must regulate their occupations, and concern themselves in the well-being of their tenants and work-people. The rich must change their habits, they must give up their self-indulgence, before the poor give up their ways of riot and drunkenness. They must cease to worship sport before the plague of gambling can be stayed in the homes of the people. They must regard marriage differently if working women are to be mothers of pure men. The rich must change their habits, they must make friends among the poor—sharing and not only giving their good things—then the poor, too, will change their habits, and feel dirt to be intolerable, brutality to be degrading. Some such change goes on in the houses of this parish where the landladies are friends of the tenants, and where friendship has become the ladder up and down which the angels of kind thoughts and acts are ever passing.

NEW INDUSTRIAL DWELLINGS IN WATERLOO ROAD.—An extensive pile of new dwellings for the working classes, occupying an area of upwards of three-quarters of an acre, is now in course of erection in Waterloo Road, the owners and builders being Messrs. Quinn & Son, who have already erected similar buildings in Bethnal Green. The buildings, which consist of eight blocks, are quadrangular in form, seven of the blocks forming the quadrangle, with another block in the centre. Each block contains six floors, the dwellings on the different floors containing one, two, and three rooms, thus affording accommodation for single men as well as for families. The buildings are calculated to house a population of

850 persons. They are substantially erected in stock and red brick, with Portland cement windows, cornices, and dressings, cement also being used in the setting of the brickwork in place of ordinary mortar. A flat roof at the top of each block serves as a drying area as well as for recreation space for children. All the dwellings are fitted with cupboards, and each has separate sinks and coppers, with dust-shoots and water-closets on each floor. The dwellings are ventilated throughout from front to back, and each floor has separate ventilators at the different landings. There are likewise special ventilators in all the bedrooms, and all the soil-pipes are ventilated. The buildings are surrounded by four streets, with access from each, the principal approaches being from Waterloo Road on the east side and Duke Street on the west. Messrs. Borer & Dobbs, of London Wall, are the architects. The situation of the buildings renders them very convenient as residences for artisans employed in the locality. There are already numerous applications for tenancies. The erection of working men's dwellings by private enterprise is a practical outcome of the exposure of the want of proper accommodation for the working classes, and, in our opinion, the best solution of the insanitary dwellings question.

THE fortieth annual general meeting of the shareholders of the Metropolitan Association for Improving the Dwellings of the Industrious Classes has been held, under the presidency of the Hon. Dudley Fortescue. The report of the directors stated that the receipts on their various properties had been during the past year about 20,829*l.*, while the expenses were 8,590*l.* The population of the entire property of the association averaged 6,030. The profits of the year amounted to the sum of 9,220*l.* 8*s.* 7*d.*, and after meeting all expenses and repairs and usual charges, and providing for a dividend of 5 per cent. per annum, there remained a balance of 741*l.* 12*s.* 4*d.*, irrespective of 499*l.* 5*s.* 6*d.* already added to the guarantee fund, being the year's interest on the same; the sum of 1,190*l.* 17*s.* 10*d.*, therefore, represented the balance of the total profits of the year, of which 741*l.* 1*s.* 4*d.* remained.

MR. WYNTER BLYTH, who for some time past has been studying the sanitary aspect of the tenement streets in St. Marylebone, records in a recent report the result of an inspection of Carlisle Street. This thoroughfare, which is parallel with Edgware Road, contains 135 houses; and in no fewer than 113 there were found nuisances of a more or less severe nature, while in 41 the drains were so faulty in construction that they had to be relaid. The street contains a population of 1,406 inhabitants, nearly all of whom belong to the working class, and to a great extent each room accommodates a family. Notwithstanding this, the average amount of cubic space was very large (1,204 feet), larger than any of the tenements hitherto considered. During Mr. Blyth's period of office there has been a good deal of sickness in this street, a few cases of typhoid and much diarrhoea; but Mr. Blyth confidently anticipates that now the drainage has been so much improved there will be a corresponding improvement in the health of the inhabitants. The annual death-rate, as deduced from the records of seven years, represented nearly 22·0 per 1,000; but in this calculation no account could be taken of the deaths of the inhabitants that may have happened in various extra-parochial hospitals, so that the rate of mortality is somewhat understated. The largest number of deaths (66) was caused by pulmonary disease, other than phthisis; zymotic fections being fatal to 36 persons, and tubercular complaints to 33.

THE exhaustive report of Dr. F. W. Barry to the Local Government Board, on the general sanitary condition of Gateshead, with special reference to the prevalence of infectious diseases in the district, has been laid before the Commission inquiring into the state of the housing of the labouring classes. Dr. Barry says that there are probably

few, if any towns in the kingdom, in which so large a portion of the population are housed in tenement houses. Only one-fifth of the entire population self-contained houses; as to the remainder, two-fifths accommodation in flats, and the remaining two-fifths tenements or houses inhabited by more than one person. The report deals with all matters affecting the health of the inhabitants, in a comprehensive and elaborate manner, accompanied by interesting statistics. Referring to the fever which he reports that 'in carrying out this inquiry I have seen nearly the whole of the houses in which cases of fever had been known to have occurred, and in which I became acquainted with many such examples of wretched housing as happily I have seldom met with elsewhere in order to remedy the unsanitary condition in which I have seen a large proportion of the tenement property in Gateshead would appear desirable that the sanitary authority be invested with powers under section 90 of the Public Health Act, 1875, to make by-laws for all houses not being cottages or lodging-houses, which are let in lodgings or occupied by more than one family.' After giving credit to the authorities for all they have done, Dr. Barry says, 'the questions most needing attention are the improvement of the dwellings of the labouring poor, including the repression of overcrowding and the abolition of the noxious system of excrement disposal and the carrying out of comprehensive schemes of house deodorisation.'

ON the 28th ult. a large and influential meeting was held in Bishop Cosin's Library in the city of Durham, under the presidency of the Bishop of the Diocese, to consider the question of the moral and sanitary condition of the dwellings of the poor, in the county of Durham. The Bishop said that in his opinion the interest that has been excited on this question throughout the country should be allowed to pass away without leading up to some practical result. It appeared to him that the subject divided itself into two divisions—making a better provision of dwellings for the lower classes by the erection of a class of houses, with improved sanitary arrangements; the provision of better dwellings by a strict enforcement of the laws already passed. The Rev. W. Moore, Rector of Gateshead, advocated the formation of Sanitary Aid Committees, which had done so much good work in London and elsewhere. Mr. Austin, of Gateshead, gave a graphic account of the sanitary defects of the town, the result of his personal inspection. The Bishop suggested the formation of philanthropic companies for the erection and improvement of dwellings for the poor, which, whilst being based on philanthropic motives, should be conducted on sound business principles. Dr. Barron, Medical Officer of Health for the County of Durham, expressed his opinion that the present law provided ample provision for the evils complained of, but he thought that the formation of voluntary Sanitary Aid Committees would further strengthen the hands of the authorities. After an interesting discussion, it was ultimately resolved to form a general Sanitary Aid Committee, or several of the leading gentlemen of the district, to be elected, with power to add members to all parties, were elected, with power to add members.

AT the Brownhills Local Board meeting on Wednesday the 25th ult., two cases of overcrowding were reported. In one a father and mother and six children slept in one room, in the other a father and mother and seven children and one lodger slept in two small rooms.

MR. A. BURR, of Queen's Square, Bloomsbury, succeeded in obtaining the first premium in the open competition for artisans' dwellings, Battersea. Forty designs were submitted.

MUCH attention is being attracted in Scotland to improved three-roomed workmen's houses now erected in Leith. Accommodation is provided for families instead of the thirty displaced, but the houses cover less ground than those they have superseded.

with range a portion of the basement has been appropriated as a coal-store, where, by arrangement with some proprietor, fuel will be kept on sale, at the lowest market price for the convenience of such tenants as may choose, at convenient times, to buy. The tenements, varying in size, are provided each with a separate staircase; care having been taken in the case of the two largest blocks to have open balconies on every landing, with a view to thorough ventilation. It is in contemplation to erect a store, where means will be taken for supplying, on demand, the miscellaneous wants of a community rather conveniently situated for access to shops and markets. A common benefit will be provided in the laying out of a strip of land between the buildings and the river. There will also be a common club-room for the tenants. Rents will be from 10*l.* to 15*l.* a year.

PARKS AND OPEN SPACES.

*The law condemns both man and woman
Who steals the goose from off the common;
But lets the greater felon loose,
Who steals the common from the goose.*

OUT-DOOR SITTING-ROOMS.—On July 1 Princess Louise (Marchioness of Lorne) performed the ceremony of opening the St. George's Burial-ground as a recreation ground. It is situated in Wakefield Street, and lies between Regent and Brunswick Squares, in the parish of Pancras. For a number of years it has been the receptacle for all kinds of refuse from an adjacent Irish tenement, and has been in a deplorable condition, in some places the tombs falling in. The Kyrle Society, of which Princess Louise is the president, took the matter up, and now have laid the ground out with shrubs and walks as a garden and place of recreation for the poor inhabitants of the district. At the opening ceremony Mr. Edward Ford, on behalf of the Kyrle Society, in an address, said that after four years' exertions they had succeeded in obtaining a faculty in laying out that garden, paying all expenses. In doing this they had received the hearty cooperation of the Rev. F. F. Goe and Mr. Gibb, the curate of St. Pancras. Miss Aubrey had also, at an expense of 200*l.*, presented them with the fountain. They had tried very hard to get the neighbouring burial-ground, but had not yet succeeded.—On the representation of the Metropolitan Public Garden, Boulevard, and Playground Association, the Rev. R. Arbuthnot has thrown open the churchyard of St. James, Ratcliff, to the public for their free use and enjoyment as a recreation ground, the necessary seats having been presented by the Association. It was owing to the action of this association that the disused burial-ground of St. Dunstan's, Fleet Street, was opened to the public a short time since; and they are about to throw open Spa Fields, Clerkenwell, and Ebury Square, Pimlico, to the public for their use and enjoyment.

ANOTHER PUBLIC GARDEN FOR NEWCASTLE.—On the 1st inst. the Mayor of Newcastle-on-Tyne opened the Ballast Hills Burial Ground, situate at Byker, Newcastle, as an ornamental garden for the use and benefit of the crowded industrial population of that district, which is intersected with many interesting historical associations. The Mayor (Dr. H. V. Newton), ever since he entered the Town Council, has been most energetic in his efforts to provide the inhabitants of Newcastle with public parks in various districts, and, after encountering much opposition at first, his labours lately have been crowned with great success. In the present case he was greatly aided by Mr. McIllor Henszell, who at the opening of the place gave an interesting retrospective glance of the history of the locality. His Worship the Mayor, also in a felicitous

speech, enjoined the inhabitants to strive individually to keep the ground in order and prevent the destruction of the beautiful shrubs and flowers with which it is adorned. He alluded to the expected opening of the Armstrong Park, one of the finest in this country, by the Prince of Wales, during his visit to Newcastle next month, and to the undeniable benefits of such open spaces in promoting the public health and happiness.

CREMATION NOTES.

THE *Sanitary Engineer* of New York states that the cremation of the body of the late Professor S. D. Gross, of Philadelphia, in accordance with his own directions to that effect, has had a tendency to increase the popularity of this mode of disposing of the dead. It has become so far the fashion in that part of the world that the proprietor of the crematory at Harrisburg announces that the demand for the services of his furnace is such that he can only undertake to supply it for the immediate vicinity.

CORRESPONDENCE.

[All communications must bear the signature of the writer, not necessarily for publication.]

THE SOUTH METROPOLITAN DAIRY.

Our attention has just been called by a subscriber to your journal to a notice you gave us in your May number, of our new undertaking, the South Metropolitan Dairy, Brixton, and we very much regret to find in it a paragraph that appears to cast a doubt upon a portion of our work, and that otherwise spoils a very favourable notice. After giving us credit for having based our 'operations upon the strictest sanitary principles,' you say—'We are not aware what is the system of sanitary inspection at the farms, nor the system of milk testing to prevent frauds by the employes at the farm and in London, nor how the health of farm servants and London carriers is secured—all essential points in the security of a milk supply.'

We are sure it was the intention of your reporter to do us justice at least, and had he put such questions to us as bear upon the above portion of the paragraph, we could have satisfied him, or the most fastidious mind on the points you have raised.

We beg to say that before we receive milk from any dairy farm, we always send down our inspector of farms who, after making a careful survey, reports to us; and unless the report is quite favourable we do not draw any milk from that farm. As to the milk testing, &c., samples of milk are taken before the carriers start, also on their return, and frequently at the point of delivery to the consumer as well as occasionally at the farms and on the railway stations. All and every churn is locked. As to the health of our servants, our medical officer visits them at their homes, and we are now about to house them under one roof. In a word we have endeavoured to keep faith with the public in the professions we have made, and to secure a really pure milk supply to the inhabitants of South London.

NASH STEPHENS & CO.

13 Grand Promenade, Brixton.

[It was not in the slightest degree our intention to cast any doubt upon the system of sanitary supervision acted on at the South Metropolitan Dairy. We simply declined to vouch for what we did not know, in so important a matter for the public health as milk supply. We are very glad to insert Messrs. Nash Stephens & Co.'s account of

the precautions taken by them for the protection of the public, in addition to the favourable opinions we have already expressed respecting their establishment.—ED.]

HAY AND HARVEST WORK WITHOUT BEER.

Farmers in considerable numbers have either given up, or are now giving up, the practice of giving their men beer in hay and harvest work. Conferences of farmers have recently been held in various parts of the country on this subject, and after full discussion it has been generally agreed that it was desirable to discontinue the practice of giving beer. At well-attended conferences of farmers in the Town Hall, Basingstoke, on June 11, and in the County Hall, Lewes, on June 17, the following resolution was unanimously passed:—

'That in the opinion of this Conference it is desirable in the interests of both masters and men that the practice of supplying beer in the hay and harvest field be discontinued, and that all work be paid for entirely in cash.'

All experience goes to prove that this change will be of great advantage to the men. They will soon fall into the way of providing themselves with good wholesome drinks at a small cost. Perhaps you will kindly assist by allowing the following receipts, that have been found useful, to appear in an early issue of your paper.

Home-Made Drinks for the Harvest.

STOKOS is a most refreshing and strengthening drink. It is easily made, and costs only 3d. per gallon.

Put into a large pan $\frac{1}{2}$ lb. of fine fresh oatmeal, 6 oz. of white sugar, half a lemon cut into small pieces. Mix with a little warm water, then pour a gallon of boiling water into it; stir all together thoroughly and use when cold. The lemon may be omitted, raspberry vinegar, citric acid, or any other flavouring may be used instead. More oatmeal may be used if preferred.

COKOS is a good nourishing drink made as follows:—8 oz. of sugar, 6 ozs. of good fine oatmeal, 4 ozs. of cocoa at 10d. per lb., mixed gradually and smoothly into a gallon of boiling water; take to the field in a stone jar. Cost 6d. per gallon.

A GOOD HARVEST DRINK.—Boil $\frac{1}{2}$ oz. hops, $\frac{1}{2}$ oz. of ginger (bruised), in 1 $\frac{1}{2}$ gall. of water, for twenty-five minutes, add 1 lb. of brown sugar and boil ten minutes more, then strain and bottle while hot; it will be ready for drinking when cold. It should be kept in a cool place. Dried horehound may be used instead of hops. Cost 3d. per gallon.

GINGER BEER.—Four two gallons of boiling water over 1 lb. of lump sugar, 1 oz. of bruised ginger, two lemons sliced, let it stand till lukewarm, then add one tablespoonful of brewer's barm, or one small teacupful of baker's barm; let it stand twelve hours, then bottle it. It will be ready for use in twenty-four hours. Cost 4d. per gallon.

Boiling water poured on a few slices of lemon, with a little sugar, makes a very refreshing drink. Butter-milk should be more used as a drink.

One ounce of coffee and half an ounce of sugar in two quarts of water is a very thirst-quenching drink. So is cold tea, but neither of these is so supporting as the oatmeal drink.

It is quite a mistake to suppose that beer or spirits give strength. They do give a spurt to a man, but that quickly goes off; and spurts in hard heavy work, too often made, certainly lessen the working powers.

JOHN ABBEY,

Secretary of the Agricultural Department, C.E.T.S.

44 St. Giles, Oxford, June 30, 1884.

[The drinks recommended are excellent, but we cannot help thinking that the names are unfortunate. Imagine the expression of a haymaker or harvest hand when asked if he would take a glass of 'Stokos' or 'Cokos'!—ED.]

COMPETITIONS.

THE INTERNATIONAL HEALTH EXHIBITION.

THE Minister of Commerce, M. Hérisson, has nominated the following as members of the jury of the International Health Exhibition, now held at London. M. Arnould, Professor of Hygiene at the Medical Faculty of Lille; M. Bérard, Secretary to the Comité Consultatif of Art and Manufacture; M. Brouardel, Gueneau de Mussy and Proust; M. Buisson, Director of Elementary Education; M. Dethomas and Dr. Liouville, deputies; M. Dutert, Inspector of Schools of Design; Dr. Gariel, Assistant Professor of Physics at the Paris Medical Faculty; M. Guillaume, Member of the Institut; M. Guy, President of the Syndical Chamber of Wholesale Distillers of Paris; M. Jacquemart, Inspector General of Technical Education and of the Art and Trade Schools; M. Jartaud, President of the Paris Syndical Chamber of Wine and Spirits; M. Jordan, Professor of Art and Manufacture at the Ecole Centrale; M. Lavezzari, Principal Architect of the Berck-on-Sea Hospital; Dr. Layel, Professor of Hygiene at the Bordeaux Medical Faculty; M. Leblanc, Member of the Academy of Medicine, formerly Chief Veterinary Surgeon of the Prefecture of the Seine; M. Lesoufaché, architect; M. de Montmahon, Inspector-General of Elementary Education; M. Emile Müller, Professor of Art and Manufacture at the Ecole Centrale; Dr. Napias, General Secretary to the Society of Public Medicine and Professional Hygiene; M. Nourrit, Printer and Publisher; M. Schriber, President of the Syndical Chamber of India-rubber; M. G. Trelat, Professor at the Ecole Special d'Architecture; Dr. Vallin, Professor at the Military Medical School of the Val du Grace.

VENTILATION OPEN COMPETITION.

At the Ventilation Open Competition just concluded at Birke Messrs. Robert Boyle & Son, of 64 Holborn Viaduct and G have been awarded the Gold Medal, the highest and only offered for their system of ventilation, it being adjudged the best.

NOTICES OF MEETINGS.

SOCIAL SCIENCE CONGRESS.

THE following 'special questions' relating to Sanitary Science been agreed upon between the local committees and the council Social Science Association for discussion in the Congress, to be in Birmingham in September next.

HEALTH.—1. What is the best method of dealing with (a) sewage; (b) the products of house and street scavenging; and products of combustion? 2. What are the best means, legislative or, of securing those improvements in the dwellings of which are essential to the welfare of the community. 3. How may the average death-rate of a population be considered an test of its sanitary condition; and by what means can the high rate of children be reduced.

VACCINATION OFFICERS' ASSOCIATION.

THE next meeting of members of this Association will be Saturday, July 19, at 2.30 P.M., at the Charing Cross Hospital School, 62 Chandos Street, Strand, W.C.

AGENDA.—1. To read minutes of last meeting. 2. Correspondence. 3. Election of members and honorary members. 4. To take consideration a letter received from Dr. Henry Stevens, Inspector of the Local Government Board, asking for information from me of this Association, as follows: 'To show how promptly action of the Vaccination Officer the protection of vaccination secured to those in infected houses. Any instances in which prompt action has illustrated its advantages.' 5. To consider pamphlet issued by 'The National Health Society' upon the of vaccination, and to move a resolution. 6. And such other business as may arise.

C. O. ELKERTON,

Hon. Sec.

20 Clarendon Street, Pimlico, London, S.

APPOINTMENTS UNDER THE PUBLIC HEALTH ACT.

MEDICAL OFFICERS OF HEALTH.

BRAND, James Montague, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the North I of the Stratton Rural Sanitary District, at £25 for one year.

CLERG, Walter, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Boston Port Sanitary District, at £50 for one year.

COGAN, Lee Fyson, L.R.C.P. Edin. and L.M., M.R.C.S. Eng., has been re-appointed Medical Officer of Health for the North Urban Sanitary District, at £150 per annum, for three years.

FISHER, Thomas, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Garstang Rural Sanitary District, at £50 for one year.

GAYLOR, Edward, L.R.C.P. Edin., and L.M., L.F.P.S. Glas., has been re-appointed Medical Officer of Health for the A Urban Sanitary District, at £20 for one year, and for the Urban Sanitary District at £20, for one year.

HOLLIS, Elphinstone, M.D., M.B., C.M., Univ. Edin., has been appointed Medical Officer of Health for the Woodbridge Sanitary District, Suffolk, at £50 for one year, *vice* M. deceased.

JAMES, James Rowland, M.B. Univ. Edin., M.R.C.S. Eng., has been re-appointed Medical Officer of Health for the Ystrad Urban Sanitary District, Glamorganshire at £150 per annum for one year.

LIVETT, Henry William, L.R.C.P. Edin., M.R.C.S. Eng., Lond., has been re-appointed Medical Officer of Health for the Wells (Som.) Urban Sanitary District, at £30 per annum for three years.

MARSHALL, William Norris, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Newent Sanitary District, at £40 for the year ending April 30, 1888.

MOXON, James Burdett, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Glanford Rural Sanitary District, at £120 per annum until June 30.

POLLARD, William Robert, L.R.C.P. Edin., L.R.C.S. Irel., has been re-appointed Medical Officer of Health for the Blackburn Sanitary District, at £50 for one year.

ROBINSON, William, M.D., M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Gateshead Sanitary District, at £350 per annum, as Medical Officer of Health, and £50 per annum for attending the hospital year to year, *vice* Green, resigned.

SEATON, Edward, M.D. Univ. Lond., M.R.C.P. Lond., has been appointed Medical Officer of Health, Public Analyst, Examiner of Gas, for the Parish of St. Luke, Chelsea, at £50 per annum, *vice* Barclay, deceased.

William Henry, M.R.C.S. Eng., L.S.A. Lond., has been Medical Officer of Health for the Maryport Urban District, Cumberland, at £33 for one year, *vice* Pearson,

George Nicholson, L.R.C.P. Edin., M.R.C.S. Eng., has joined Medical Officer of Health for the No. 1 Division of Wycombe Rural Sanitary District, at £40 for one year, man, resigned.

Henry Octavius, M.R.C.S. Eng., L.S.A. Lond., has been Medical Officer of Health for the Cleckheaton Sanitary District, at £40 for one year.

William, M.B., C.M. Univ. Aberd., has been re-appointed Officer of Health for the South Division of the Stratton Sanitary District, at £15 for one year.

George, L.R.C.P. Lond., M.R.C.S. Eng., S.S. Cert. Cantab., re-appointed Medical Officer of Health for the Bishopscote, Buntingford, Hertford, and Ware Rural, and the Hertford, Hertford, and Ware Urban Sanitary Districts, at £600 per annum, for five years.

Thomas, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the No. 2 Division of the Ware Rural Sanitary District, at £35 for one year.

S, CLERKS TO GUARDIANS, INSPECTORS OF NUISANCES, &c.

Mr. James, has been appointed Inspector of Nuisances for the Scarborough Urban Sanitary District, at £105 per annum, lay, resigned.

Mr. John Jacob, has been appointed Public Analyst for the Borough of Penryn, *vice* Parry.

Joseph, has been appointed Surveyor to the Shildon and Uckley Local Board and Urban Sanitary Authority, at £45 per annum, and Inspector of Nuisances at £60 per annum, *vice* Laycock, appointed Surveyor to the Walker Local Board and Urban Sanitary Authority.

Frederick, has been appointed Inspector of Nuisances for the Wareham Urban Sanitary District, at £10 per annum, bbs, resigned.

Mr. Thomas, Branch Manager of the London and Pro-Banking Company, has been appointed Treasurer to the City Local Board and Urban Sanitary Authority, and to the City Guardians and Rural Sanitary Authority, Monmouthshire, Green, resigned.

John, has been appointed Surveyor and Inspector of Nuisances to the Corporation and Urban Sanitary Authority of Wycombe, Bucks, at £150 per annum, *vice* Wakelam, joined the appointment.

Herbert Edward, Manager of the Chipping Sodbury of the National Provincial Bank of England, has been appointed Treasurer to the Chipping Sodbury Guardians and Sanitary Authority, *vice* Foxwell, resigned.

George J. C., C.E., has been appointed Surveyor and Inspector of Nuisances to the Corporation and Urban Sanitary Authority of St. Helens, at £400 per annum, *vice* Hart, resigned.

Thomas, has been appointed Inspector of Nuisances for the Leighton Buzzard Rural Sanitary District, at £83 per annum, *vice* Mr. W. Brown, deceased.

B., has been elected Chairman of the Bilston Improvement Commissioners and Urban Sanitary Authority for the year.

Mr. Christopher Lethbridge, Solicitor, has been appointed to the Launceston Local Board and Urban Sanitary Authority, at thirty guineas per annum, *vice* Mr. J. L. Cowland, resigned.

Mr. F., has been appointed Collector to the Awre Local and Urban Sanitary Authority, Gloucestershire, at £15 per annum.

Mr. John, has been re-appointed Inspector of Nuisances for the Glanford Brigg Rural Sanitary District, at £100 per annum and Surveyor at £10 per annum until June 30, 1886.

Mr. G. E., has been appointed Collector to the Corporation and Urban Sanitary Authority of Blackburn at £120 per annum.

Mr. Thomas, has been appointed Accountant to the Corporation and Urban Sanitary Authority of Bradford, Yorkshire, per annum.

Mr. Francis Joseph, Solicitor, has been appointed to the Reeth Guardians and Rural Sanitary Authority, at £40 per annum, as Clerk to the Guardians, and as Clerk to the Rural Sanitary Authority, to the Attendance Committee, and to the Assessment Committee, he fixed from time to time, and fees as Returning Officer per independent Registrar of Births, &c., *vice* Tomlin, d.

Mr. Christopher, on being relieved of his duties as Inspector of Nuisances, is to be continued as Surveyor to the Wough Local Board and Urban Sanitary Authority, at £200 per annum, and £25 per annum for the Water Works.

Mr. Thomas, has been appointed Collector to the West Wootton Improvement Commissioners and Urban Sanitary Authority, at £125 per annum, *vice* Downey, appointed tant.

Mr. John, has been elected a Member of the Dronfield Local Board and Urban Sanitary Authority, *vice* Rhodes, d.

Mr. Samuel, has been re-appointed Inspector of Nuisances for the Whitwick Urban Sanitary District at £0 per annum, for the year ending June 24, 1886.

Hill, Mr. F. A. Brooks, Bank Manager, has been appointed Treasurer to the Pewsey Guardians and Rural Sanitary Authority, *vice* Wood, resigned.

HOLDROVD, Mr. Alfred, has been re-appointed Inspector of Nuisances for the Cleckheaton Urban Sanitary District, at £30 for the year ending June 24 next.

HOOLEY, Mr. Cosmo C., has been appointed Surveyor to the Barton-upon-Irwell Rural Sanitary Authority, at £125 per annum, *vice* Price, resigned.

HOULERSHAW, Mr. William, has been appointed Inspector of Nuisances for the Liversedge Urban Sanitary District, Yorkshire, at £26 per annum, *vice* Womersley, whose appointment has expired.

HUGHES, Mr. Thomas, has been appointed Public Analyst for the Borough of Newport, Mon., until Sept. 11.

JONES, Mr. E. W. T., has been re-appointed Public Analyst for the Borough of Walsall for one year.

KNIGHTS, Mr. James West, has been re-appointed Public Analyst for the County of Huntingdon.

MANN, Mr. Robert, has been elected a Member of the Handsworth Local Board and Urban Sanitary Authority, *vice* Bragge, deceased.

McNEILL, John Patrick, M.D. Univ. Dub., has been re-appointed Public Analyst for the Borough of Tiverton.

NIXON, Mr. Thomas, has been re-appointed Inspector of Nuisances for the Stafford Rural Sanitary District, at £50 per annum, in addition to £15 and £35 per annum, as Inquiry and Attendance Officer to the School Attendance Committee.

PLATT, Mr. Samuel, has been appointed Inspector of Nuisances for the Gainsborough Urban Sanitary District, at £30 per annum, *vice* Greenhalgh, relieved of his duties (but continued as Surveyor).

PONTING, Mr. Frederick William, Banker, has been appointed Treasurer to the Preston Guardians and Rural Sanitary Authority, *vice* Dalby, resigned.

PRICE, Mr. John, C.E., Assoc. M. Inst. C.E., M.S.E., has been appointed Surveyor and Inspector of Nuisances to the Toxteth Park Local Board and Urban Sanitary Authority, at £350 per annum, *vice* Hall, deceased.

RIDLINGTON, Mr. Walter, has been appointed Surveyor, Inspector of Nuisances, and Collector to the Holbeach Local Board and Urban Sanitary Authority, at £100 per annum, *vice* Douse, resigned, after nearly twenty-two years' service.

RILEY, Mr. Thomas, has been elected a Member of the Board of Fleetwood Commissioners and Urban Sanitary Authority, *vice* Warbrick, deceased.

ROBINSON, Mr. Thomas, has been elected a Member of the Nelson Local Board and Urban Sanitary Authority, *vice* Elliott, resigned.

SHAW, Mr. Joseph, has been appointed Surveyor to the Stainland-with-Old Lindley Local Board and Urban Sanitary Authority at £15 per annum and re-appointed Inspector of Nuisances at £30 per annum for three years, from April 11 last, and Collector at £10 per annum (£65 altogether).

SMALLPIECE, Mr. Gilbert John, has been appointed Treasurer to the Guildford Guardians and Rural Sanitary Authority, *vice* Haydon, resigned.

STAINTHORPE, Mr. Thomas William, has been appointed Surveyor and Inspector of Nuisances to the newly-formed Eston Local Board and Urban Sanitary Authority, at £150 per annum, for three years, from July 1.

STEPHENSON, Mr. John, has been re-appointed Inspector of Nuisances for the Boston Port Sanitary District for one year.

STUART, Mr. Charles Madock, has been appointed Public Analyst for the Borough of Newcastle-under-Lyme, *vice* Purdie, resigned.

THORPE, Mr. G. A., has been appointed Deputy Accountant to the Corporation and Urban Sanitary Authority of Bradford, Yorkshire, at £200 per annum.

UNWIN, Mr. W. T., has been appointed Surveyor and Inspector of Nuisances to the March Local Board and Urban Sanitary Authority, at £80 per annum, *vice* Amos.

WAKELAM, Mr. Henry Titus, C.E., who was appointed Surveyor and Inspector of Nuisances to the Corporation and Urban Sanitary Authority of Chepping Wycombe, Bucks, has declined the appointment, and continues as Surveyor and Inspector of Nuisances to the Corporation and Urban Sanitary Authority of Oswestry, at the increased salary of £150 per annum.

WHITTAKER, Mr. John, has been appointed Surveyor, Inspector of Nuisances, and Collector to the Worsborough Local Board and Urban Sanitary Authority, Yorkshire, at £140 per annum, with house, gas, and water, *vice* Senior and Wilkinson, resigned.

WILLIAMS, Mr. Frederick Edward, has been appointed Clerk to the Leigh Guardians and Rural Sanitary Authority, Lancashire, at £120 per annum as Clerk to the Guardians, £60 per annum as Clerk to the Rural Sanitary Authority, £30 per annum as Clerk to the Assessment Committee, £20 per annum as Clerk to the School Attendance Committee, and fees as Returning Officer and Superintendent Registrar of Births, &c., *vice* Heywood, resigned.

VACANCIES.

MEDICAL OFFICER OF HEALTH for the Nottingham Urban Sanitary District.

MEDICAL OFFICER OF HEALTH for the Cork Urban Sanitary District.

MEDICAL OFFICER OF HEALTH for the Whitby Urban Sanitary District.

MEDICAL OFFICER OF HEALTH for the No. 1 or Whitby Division of the Whitby Rural Sanitary District.

MEDICAL OFFICER OF HEALTH for the Grange Urban Sanitary District, Lancashire.

CLERK to the Oundle Guardians and Rural Sanitary Authority. **SURVEYOR** to the Swinton and Pendlebury Local Board, Lancashire. **SURVEYOR AND INSPECTOR OF NUISANCES** to the Haverhill Local Board and Urban Sanitary Authority: £100 per annum, from year to year, with the prospect of additional salary as Manager of the Gas Works. Application, 21st inst., to Charles F. Freeman, Clerk, Haverhill, Suffolk.

SANITARY INSPECTOR for the Parish of St. Pancras, £90 rising to £100 per annum. Application, 17th instant, to Thomas Eccleston Gibb, Vestry Clerk, Pancras Road.

LOCAL INTELLIGENCE.

The Stoke Damerel Rural Sanitary Authority and their officers have subscribed for a tablet in memory of their late chairman, Mr. F. C. Rickard, which has been placed in the Board room. It consists of a slab of coloured stone, on which is placed a white marble scroll, bearing the following inscription:—'This tablet is erected by the Commissioners of the Poor of Devonport and their officers in remembrance of the late Francis C. Rickard, Esq., who for twenty-six years was a member of the Board, and for the last fourteen years faithfully carried out the duties of Chairman. April 1884.'

The Cambridge Improvement Commissioners and Urban Sanitary Authority have passed the following resolution by 17 votes to 10:—'That it is expedient to apply in the next session of Parliament for legislative sanction to alter the constitution of the Board of Commissioners, and to amend the provisions of the Local Acts and the Award Act with respect to the relations between the university and the town on the basis of the provisions of the Bill of 1874; and empowered the Parliamentary Committee to take the necessary steps for carrying it into effect.'

The Denton Local Government District is to be merged in the Haughton District, on Sept. 29, by Provisional Order of the Local Government Board.

The Barking-Town Local Board and Urban Sanitary Authority have increased the salary of the Surveyor from £80 to £150 per annum, and that of the Inspector of Nuisances from £40 to £70 per annum.

The Maryport Urban Sanitary Authority, upon a vacancy for a Medical Officer of Health having arisen by the resignation of Dr. Pearson, have increased the salary from £25 to £50 per annum.

At Llandysilio, a statutory meeting of owners and ratepayers was held some time since, and a resolution passed, that it was expedient that it should be constituted a Local Government District. An inquiry was then held in accordance with the Act of Parliament; but as certain works of drainage, &c., had not been carried out, the Inspector declined to report in favour of the resolution. They have now, however, been completed, and another inquiry held, at which the Inspector intimated that he would report in favour of the parish being constituted a Local Government District under the title of 'The Menai Bridge Local Government District,' with a Board of nine members, Mr. H. Bulkeley Pryce to be the returning officer.

The parish of East Grinstead has been constituted a Local Government District by Provisional Order of the Local Government Board. There are to be twelve members, and, if there should be a contest, the voting-papers are to be collected on August 20.

The St. Anne's-on-the-Sea Medical Officer of Health commences his report to the Local Board and Urban Sanitary Authority, dated July 1, with the following satisfactory sentence:—'During the past month not a single death has taken place in this district.'

The Stafford Rural Sanitary Authority, at their meeting on June 21, reconsidered the proposed reduction of the salary of Dr. George Reid, the Medical Officer of Health, from £75 to £50 per annum, in compliance with the request of the Local Government Board (see page 574); and, after a short discussion, a resolution that a reply be sent to the Local Government Board to the effect 'that the authority could not come to any other conclusion than that previously arrived at,' was proposed and carried by 11 votes to 3.

The Colchester Town Council and Urban Sanitary Authority, have voted Two hundred guineas to Mr. Charles Clegg, the Surveyor, in recognition of his extra services in connection with the erection of a water tower, &c., instead of increasing his salary £80 per annum, which he had asked for.

CREDIT IMPROVEMENT COMMISSIONERS AND URBAN SANITARY AUTHORITY.—At the annual election on the 1st instant, the following were elected commissioners for the ensuing three years, viz.:—Messrs. James Templeton, *John Squire, William Pope, *G. H. Chaplin, *W. H. Symes, William Dodridge, *James Searle, *G. Bicknell, *William Labbett, and *A. A. Gale. (* Retiring commissioners re-elected).

VACCINATION OFFICERS' ASSOCIATION.

THIS association was inaugurated on Feb. 16, 1884, and has already on its roll of members almost every vaccination officer of the metropolis and surrounding districts, and as honorary members a large number of public vaccinators, medical officers of health, and other distinguished persons interested in the promotion of vaccination. The association has received the cordial support of Henry Stevens, Esq., M.D., one of Her Majesty's Inspectors under the Local Government Board, who, under date Jan. 31, 1884, wrote to the promoters of the association as follows:—'I may state that I fully sympathise with you in your desire to unite together for mutual support and co-operation, and I believe that much advantage might accrue to the community by securing a more complete administration of the Vaccination Acts through such combination.' The objects of the association are to secure as far as possible uniformity of action in working of the

Vaccination Acts, the exchange of experience and advice, mutual benefits of its members. The members of the association consider and answer all matters of correspondence submitted for consideration, and will, to the best of their ability and assist all brother officers in any matters of interest arising out of their duties. The association will further endeavour to obtain such alterations in matters of detail as from time to time in their opinion prove beneficial to the cause they represent. The association is a public vaccinator, and medical officer of health, and is cognisant of the many difficulties and hindrances that are met with in the proper enforcement of vaccination, which, when properly enforced, has repeatedly proved to be of incalculable benefit to the community, and the association by thorough combination and with the hearty support and aid of the medical profession generally, and others interested in the promotion of efficient vaccination, the objects of the Association will be better served in the future, and the public health safe more thoroughly. The association do not confine themselves to London and districts only, therefore the support of all vaccination officers, public vaccinators, and medical officers of health throughout the country is earnestly desired, and the association appeal to gentlemen to become members and honorary members. The subscription for members (vaccination officers) is 5s., and for members 10s. The association is under the management of elected officers and committee, consisting of twelve, who are elected at annual election at the general meeting in February, annual balance-sheet and report will be published. Application for membership, honorary membership, rules, and all other information can be obtained of the honorary secretary, Charles O. Elk Clarendon Street, Pimlico, S.W.

MANAGEMENT.

Chairman.—Mr. Charles Shattock, St. Mary Abbots, Ken. **Vice-Chairmen.**—Mr. William M. S. Sherman, Whitechapel; William H. Ward, Bethnal Green.

Treasurer.—Mr. John H. Richards, St. Pancras.

Honorary Secretary.—Mr. Charles O. Elkerton, St. Hanover Square.

Committee.—Mr. Charles Atkins, vaccination officer, Leamington; Mr. William Bence, vaccination officer, Edmonton; Mr. C. Elkerton, vaccination officer, St. George's Union, Middlesbrough; Mr. Charles Hearson, vaccination officer, Lambeth; Mr. William Shattock, vaccination officer, Islington; Mr. Thomas W. Maslen, vaccination officer, Greenwich; Mr. J. K. Moloney, vaccination officer, St. Pancras; Mr. John H. Richards, vaccination officer, St. Pancras; Mr. Shattock, vaccination officer, Kensington; Mr. William M. Man, vaccination officer, Whitechapel; Mr. William John vaccination officer, Mile End Old Town; Mr. William H. vaccination officer, Bethnal Green.

Honorary Members.—Lieut.-General Batten, 14 Notti Square, Kensington, W.; Dr. Charles Thomas Blackman, 41 Grove, N.; Dr. W. Piddell Bruntton, 43 Kirkdale, Sydenham; Dr. Edwin Child, Kingston-on-Thames; Dr. C. C. Claremont, brooke House, Hampstead Road, N.W.; Dr. Robert (Thomas's Hospital); Dr. Richard Fegan, Westcombe Park, Heath, S.E.; Dr. Charles Maynard Frost, 47 Ladbrooke Notting Hill, W.; Dr. William Hall, Tottenham, Middlesex; Dr. Henry F. E. Harrison, 33 Shepherd's Bush Green, W.; Dr. Loane, 1 Dock Street, Whitechapel, E.; Mr. Shirley F. St. Pancras; Dr. Robert S. Nightingale, 658 Commercial Road, E.; Dr. John Reid, 12 Bridge Avenue, Ham W.; Dr. George A. Rogers, 164 High Street, Shadwell, Thomas Scoresby-Jackson, 'St. Hilda,' Hoe Street, Waltham, Essex; Dr. James Smart, 256 Cambridge Road, E.; Dr. Townsend, 27 Upper Phillimore Place, Kensington, W.; Dr. G. Wells, Beaumont Terrace, West Kensington, W.

NOTES AND QUERIES.

Having for some time back been in the receipt of Queries relating strictly to sanitary work, and which it would be easy to without having to refer our correspondent to competent professional advisers, we have opened a column in which to register such Queries. Replies thereto as can fairly be expected from us; and our subscribers and readers are invited to make such use of this column as to benefit themselves and the community. Both Queries and answers will, however, be subjected, if unnecessarily long, to a strict cut.

125. FLOWERS IN SICK ROOMS.

Are cut flowers unhealthy in a sick room? Are flowers in pots unhealthy in a bedroom either during the day or night?

[Healthy plants and cut flowers are not unwholesome in other inhabited rooms, and in those cases where mischief from their presence, it is invariably caused by fungi generated in the stale, unventilated earth of the pots, or in the putrid water in which cut flowers are kept. To secure immunity from any effects the water of cut flowers must be frequently changed, the potted plants be effectually drained, and have the earth stirred up from time to time. Interesting papers on this may be consulted by reference to the *Lancet*, Vol. ii., 1877; the *Practitioner*, Vol. ii., 1881, p. 387, and Vol. i., 1882, and also to the *British Medical Journal*, Vol. i., 1884.—ED.]

ORIGINAL PAPERS.

NOTIFICATION OF INFECTIOUS DISEASE: ITS IMPORTANCE AND DIFFICULTIES.*

By ALFRED HILL, M.D.,

Medical Officer of Health for Birmingham.

IER Lord Bacon did or did not say that 'edge is power' matters little compared with the importance of the truth expressed in the dictum: 'a knowledge of the causes, symptoms, and nature of a disease, we should possess very little to alleviate or cure it; but without a knowledge of its existence, none at all.

For to prevent the spread of disease, and the possibility of one or two cases developing into a rapid and fatal epidemic, a knowledge of the nature of first cases is indispensable. The importance of this knowledge, I presume, will be universally admitted. There is only one way of using such knowledge, and that is by means of notification, the imparting of it or making it known to the proper person or authority.

Noting out the small section who deny the utility of notification at all as too insignificant to demand attention, there are two classes: those who agree that notification is desirable, and those in opposition to each other as to the person on whom should the duty of notifying devolve. This question is one not so much exercising the mind of the general public as that of the members of the medical profession, but it is one upon which, on this account, it is very desirable there should be as nearly as possible unanimity of opinion and action among medical men, as it is in them and them alone that primarily the duty of notification of some kind must rest, and without co-operation any notification of a thoroughly useful kind is impossible. There is a difficulty, however, in obtaining this unanimity, and while one member of the profession fully admits the importance and necessity of notification, and is willing to do it, another, and, I believe, a smaller and less enlightened one, strenuously resists all attempts to impose the duty upon them, maintaining that it should be imposed solely on the householder or on the guardian.

At first sight there is a certain amount of reasonableness in this view of the case, but even when its advocates proceed to argue that notification is in operation it has had the effect of doing harm rather than good. If this is the case, instead of declaring that they are in favour of early notification as an abstract proposition, they should, to be logical, declare themselves against it, unless they are prepared to prove that notification by the householder is beneficial, while notification by medical men is injurious.

We are here to consider the alleged objections to compulsory notification by the medical attendant, and those which constitute the chief obstacles or difficulties with which notification has to contend.

One of these is the compulsory character of the notification pure and simple, no objection being made to the proposal to put compulsion

on the householder or guardian, though I fail to see that compulsion as such need be considered more objectionable by a professional than by a non-professional informant. It is, however, said to be derogatory to a medical man's dignity and self-respect to be so compelled. But wherever a duty of great importance to the general welfare has to be performed, the only way to ensure its performance is to make it compulsory; to make the Act simply permissive would inevitably mean failure from non-compliance on the part of some, where it is essential that compliance should be made by all. It is rather late in the day for medical men to display such extreme sensitiveness on this point, and to treat it as though it were a new principle and practice. They are accustomed to notify under compulsion the deaths of persons whom they have attended; and although it is true that when this measure was originally proposed it met with similar opposition to that now exhibited to the notification of disease, it became law; and while it proves a great public advantage, it is found to be in no way detrimental to the interests of the medical man, or hurtful to his *amour propre*. Compulsion again is seen in the laws in respect of registration of medical men, and of their services as scientific witnesses, in respect of the sale of poisons, and more heavily still with regard to the provisions for the practice of vivisection. Under these circumstances, it seems difficult to understand why, when another service inseparably connected with professional duty, and inferior to none of the others in importance, is required in the interests of public health, there should be such a violent opposition to its imposition. It seems to me that the dignity of medical men, instead of being injured by the performance of the duty required, would be greatly magnified and enhanced. All law is associated with compulsion, which is as indispensable to control the action of non-medical men as of medical. This is seen in the registration of births, vaccination, education, regulation of hours of labour in mills, manufactories, and other places, service on juries, and numerous other matters, and it is only because it is impossible to accomplish the object in view by voluntary action that penalties become necessary. It has been urged by one opponent of compulsory notification that the voluntary principle is the true one, that it has been known to succeed, and he does not see why it should not be adopted everywhere. There is a simplicity about this view which renders any serious consideration of it unnecessary.

No one will deny, I presume, the value for various purposes of the certification by the medical man of cases after death, but it is of little use as regards the prevention of disease, because it comes too late; notification seeks to remedy this defect by giving to the sanitary authority the earliest information possible of the case, by which not only may the best be done for it in the way of removing causes, and rendering assistance in various ways, so as probably to prevent a fatal termination, but also to prevent the spread of the disease to other members of the household and to neighbours. The causes of the disease are often not inquired into by the medical attendant, who is apt to regard his duties more as curative than preventive; it is seldom that he makes a searching examination of a house with the view of discovering sanitary defects, whereas the duty of a medical officer of health is not to meddle in any way with a patient, but to seek for any existing defect in the sanitary arrangements of the dwelling. Let us

*Read at the Conference organised at the International Sanitation by the Society of Medical Officers of Health, the Sanitary Institute of Great Britain, and the Parkes Museum of Hygiene, June 13, 1884.

take a common case; a member of a family may be suffering from diphtheria or typhoid fever, which the medical attendant may skilfully diagnose and treat, but he may content himself with some general inquiry as to the sanitary condition of the house and its surroundings without making a rigorous investigation; the cause of the illness may be probably a sink or cellar drain in direct communication with the sewer, or it may be a faulty water-closet, leaky soil pipe, a polluted well, or some similar defect, discoverable only by such an investigation as would be made by the medical officer of health. If this exciting cause of the illness be allowed to remain during the illness, there is little likelihood that the patient will recover, but if speedily removed the probabilities of recovery are immensely enhanced, *causa sublatâ tollitur effectus*. So that not only is the recovery of the patient rendered more likely, but the dangers of the spread of the disease are likewise diminished. This illustration will serve to indicate the value of early notification, and one of the directions in which it is calculated to be of advantage.

The objection to voluntary notification is that it is incomplete, and, as human nature is constituted, probably ever must be, but unless complete it is useless for the prevention of epidemics; it is only because of its incompleteness, and, therefore, uselessness under the voluntary system, that it is necessary to resort to compulsion. The value of complete notification was well seen in Birmingham during the early days of the present visitation of small-pox. This disease is one which from its rarity, and from the dread of it in the minds of the public, is more likely to be spontaneously notified than any other ordinary zymotic; the consequence was that for many months the disease could get no footing in the town, because under the influence of fear every case was notified to me directly on its nature being made out; over many months seventy-seven sporadic cases were reported, with the result that the disease was prevented spreading by means of isolation, disinfection, &c.; but in time cases occurred which were not reported, and then the disease, liberated from control, rapidly became epidemic; as long as every case was reported the epidemic was prevented, but no longer. The voluntary system answered for a time, but soon broke down as it always will do, and as it always has done from time immemorial to the present. The experiment has been made so long that it is unnecessary to continue it; it has indeed lasted too long, and to continue it still is altogether unjustifiable. Of the three hundred practitioners in Birmingham only one hundred and eighteen have ever voluntarily notified.*

* In reference to this statement, Mr. Lawson Tait, F.R.C.S., wrote to a daily contemporary:—'The experiment has been conducted by the Health Committee, of which I am chairman, and I am not aware that they have expressed any opinion whatever to the effect that it is a failure. Personally I regard it as a success, and the fact that nearly 8,400 cases were reported last year is sufficient evidence in support of my belief. In 1877, before the experiment began, we admitted only 43 cases of scarlet fever to the hospital, while last year we admitted 638, a number much larger than we had satisfactory accommodation for. The Town Council has just sanctioned an expenditure of £8,000 for a new hospital for scarlet fever, and last year they distinctly refused to apply for powers to secure compulsory notification in the Consolidation Act. We believe, therefore, that compulsion is wholly unnecessary. There are only 257 practitioners in the Medical Directory returned as practising in Birmingham, and of these I believe there are only 140 practising in such a way as to be likely to be called upon to deal with infectious diseases within the municipal area. As Dr. Hill tells us 118 have notified voluntarily, we may take it that there are only some 22 whom we have yet to convert to our views.'

The voluntary system answers very well in the case of cholera, because so great is the alarm and even horror excited by the disease, that it is practically compulsory, in other words, that result is effected by fear which is denied by reason. But in the case of a disease of which there is no fear, such as scarlet fever, although it is a thousand times more destructive to life, the voluntary system breaks down altogether. Instead of the medical man reporting every case of preventable disease, he reports only such as he chooses; he will report for instance the case of a domestic servant whose presence in a large and respectable family is considered objectionable, and whose removal is therefore desired, and she is removed to the hospital accordingly, but the next case he may for special but insufficient reasons decline to notify, although the danger to the public may be as great in the one case as in the other.

There is generally no reticence in publishing to the whole world the illnesses of Royal or distinguished personages, and in much more detail than is required for the protection of the public health, while in notification of disease to the sanitary authority there is no publication at all, there is simply intimation accepted in confidence and acted upon with the sole view of benefiting the patient and the community. Notification to be of real value must not be optional but imperative, it must not be sub-ordinated to individual interests or caprice, because it is then too uncertain, too impartial, and frequently too late. As a fact I frequently receive from the medical man notification of cases of zymotic disease after being attended by him for several weeks, and sometimes after the death of the patient. This is under the voluntary system which obtains in Birmingham, although for such information a fee of five shillings is paid. To expect efficient, that is, complete notification by voluntary means, is to ignore all past experience, and to display a credulity which would discredit an intelligent child.

Another alleged objection to notification by the medical man is that it leads to the concealment of cases, and consequent spread of disease, but the proof of this has never been forthcoming, and the objection rests on mere assumption. Let us hear on the contrary what is said by some who have had experience of the actual working of the compulsory clauses, for a little practice is worth much hypothesis, however ingenious. Dr. Butterfield, when Medical Officer of Health of Bradford, wrote, 'As to the allegation that people would conceal infectious disease, and not send for medical advice for fear of having the case reported, I can safely say that such has not been the case in this town.' The Mayor of Macclesfield says, 'Our experience is that compulsory notice does not tend to concealment, but rather the reverse.' The Mayor of Oldham gives similar testimony, and the same with other towns; while in Dundee it was found that there was less concealment of disease after notification was made by the medical attendant, than there had been previously when the duty rested with the householder. It thus appears that there is no ground for the assumption of notification leading to concealment, and if there were, it would constitute an argument against notification, whether by the householder or the medical man, and is therefore an argument against notification altogether.

It is further asserted that compulsory powers promote antagonism between the medical practitioners

and the medical officer of health. If this be so, I am bound to say that I have failed to find evidence of it worthy of the name; it might be possible by diligent inquiry to discover a solitary case of the kind; but 'one swallow does not make a summer,' and it has happened more than once that conflict of opinion and antagonism have arisen between even practitioners themselves on other questions than that of notification. For many years in Birmingham there has been voluntary notification, but in no single instance has any antagonism, or even unpleasantness arisen between the medical men and myself. Abundant testimony to the same effect is afforded in towns where the notification is compulsory; thus at Leicester, Alderman Windley stated that 'All fear of collision between the medical officer of health and the profession had died out, and the certificates were sent in without difficulty;' at Bradford Dr. Butterfield reports, 'I know of no medical man who is opposed to the working of the Act.' The Mayor of Oldham states 'that there has been no unpleasantness with the medical profession in putting the clauses into effect; they have as a body willingly co-operated with the medical officer of health;' and from Llandudno we hear that 'to the credit of all our medical men, they work most harmoniously with the board.' After the unvarying testimony of such a cloud of witnesses there seems to be no ground for alleging antagonism, with which it would seem that opposition has possibly been confounded.

If such antagonism were found to exist between the medical profession and the medical officer of health, 'twere a grievous fault,' and it would be necessary to discover the causes of it, and remove them, because no good is to be expected without the cordial co-operation of the medical profession with the sanitary authority.

It has been alleged that the conduct of the medical officer of health is likely to be inquisitorial, and that he may interfere with the patient, and otherwise take advantage of his opportunities to annoy and injure the practitioner. This contingency is so remote and improbable that it is scarcely worthy of serious discussion. No medical officer of health properly qualified for his duties could act in such a manner; to suppose otherwise would be to assume that the moment a medical practitioner becomes a medical officer of health he forgets professional obligations, and loses the instincts of a gentleman, which is not only absurd, but opposed to experience.

There have been doleful predictions that notification by medical men would be a betrayal and destruction of that confidence which is necessary between doctor and patient; such would no doubt be the case in some instances if there were no compulsory law requiring it, if the secrets of the sick room were published, instead of the case being simply notified, if the object were to injure instead of benefit the patient and the community, and if all medical men were not placed under the same necessity to notify; when further, it is the rule for the householder, as well as the doctor, to notify, the former can have no possible ground of complaint in this direction. Here is seen one of the advantages of the dual system. It was attempted by Mr. Ernest Hart in his 'model clause' to meet this question of betrayal of confidence, and at the same time the objection of medical men to be put under a penalty, and, in order to do this, he proposed that compulsory

notification should be put upon the householder, to whom the medical attendant must furnish a certificate, which the householder is bound by penalty to forward to the sanitary authority, while no penalty falls upon the medical attendant in the event of his refusal to certify. The weak point of this clause is that it is impossible to obtain the co-operation of all medical men without the imposition of a penalty, so that this objectionable regulation is really rendered necessary by the fault of the medical profession itself, which, therefore, cannot reasonably complain. *Salus populi suprema est lex.*

It is a remarkable fact that out of thirty-eight towns in Great Britain which have availed themselves of compulsory notification thirty-four have adopted the system of direct notification by the medical attendant, while thirty of these require notification also by the occupier. In three of them only does it rest with the medical man to notify indirectly or to the occupier, so that the dual system is found to be by far the most in favour: it is the one recommended by the Local Government Board in 1878, and by the Select Committee of the House of Commons in 1882; it is theoretically the only efficient one, and in practice it has been proved to work satisfactorily. It is the system embodied by Mr. Hastings in his Bill of 1883; and it is, I believe, the one which commends itself to all impartial minds and to all persons of experience.

The reasons why the medical man should notify appear to be so plain: he alone is qualified to diagnose the disease; he alone—bearing in mind the ignorance, poverty, and other disqualifications of large numbers of persons—is qualified by his education, his appreciation of the necessities of the case, his freedom from interest, prejudice, alarm, or confusion to notify it; and he would by his direct action save much unnecessary delay.

As a fact, where notification is carried out, it is nearly always by the medical man, even under the dual system.

The householder, on the other hand, is disqualified to report with promptitude and certainty by a number of circumstances, partly from reasons already stated, and also for some others, as want of time and opportunity. One insuperable obstacle would be created by the impossibility of supplying every householder with notification forms, and if that difficulty could be surmounted the forms would soon be lost. It is desirable, nevertheless, to hold the householder responsible to meet cases where a medical man is not called in.

In one town only has notification by the householder been tried, viz., Greenock, and, as might be expected, the results are very unsatisfactory, as only something over 50 per cent. of the cases came to the knowledge of the sanitary authority; but even under these circumstances the death-rate of the town diminished progressively and considerably; it is therefore clear that with a more complete system a proportionately greater advantage would have been gained. Dr. Wallace, medical officer of health of Greenock, concludes a very valuable and interesting report by expressing a fear 'that no further material improvement will take place from notification by the householder.' He is forced to the conclusion that the only satisfactory method of notifying infectious disease would be to throw the responsibility on the medical practitioner, as well as on the householder; in other words, the dual method.

It has been urged as an objection against notifica-

tion, and this objection holds good in the case of the householder, as well as of the medical attendant, that it would be injurious to business. This is possible to a certain extent, but my experience shows that it is a great advantage by removing real danger, and so permitting the business to be carried on with safety. In several instances I have had employes in large establishments removed to hospital to the advantage of the patient, and to the great relief and protection of the other inmates and the public; the proprietors have been shrewd enough to discover the advantage, and grateful for the assistance rendered. In such cases, of course, removal is carried out as quietly as possible, measures of disinfection and precaution are judiciously conducted, and no publicity results. But even should there be publicity, and the business suffer in consequence, either through customers avoiding the shop or the latter being temporarily closed, surely this is a smaller evil than the disease being allowed to remain unreported, and left to spread itself broadcast.

Circumstances have come to my personal knowledge which clearly prove the necessity of the sanitary condition of lodging-houses being known. A short time ago two Birmingham artists who had been to Jersey for a few weeks returned home suffering from typhoid, and one of them died; the disease was traced to their lodgings. Such cases are quite common; people leave home to recuperate their exhausted energies at a maritime or other health resort, and in some lodging-house or hotel contract a dangerous, often fatal illness. Notification would prevent such horrible catastrophes, and I am fully convinced that the hotels and lodging-house keepers would be benefited, instead of prejudiced, by the arrangement. If they were alive to their real interests, they would court examination and certification of the sanitary condition of their establishments rather than attempt concealment of defects and dangers; indeed, some hotel-keepers do actually have their hotels systematically examined and certified by a competent person, and such a course cannot fail to inspire confidence in their guests.

Milk shops and schools are particularly liable to prove centres of preventable sickness and death, unless cases of illness in them are at once notified. It is wonderful to find any one prepared to contend that the proprietors of trade and other establishments should be protected at the expense of the whole community, and it implies a singular excess of innocent belief in the perfection of human nature to expect them in all cases to give notice of the danger in their midst, when at the same time they believe that their interests will be thereby prejudiced.

The absence of adequate and suitable hospital accommodation has been cited as an argument against notification. The objection has, however, much less force than at first sight it appears to have. Very much can be done without a hospital, though I am far from supposing that hospitals are not necessary and indispensable. There is, however, very generally a backwardness on the part of the sanitary authorities to provide them on account of the expense, and some powerful influence is required to put them in motion. It is a fact, proved by experience, that nothing conduces so much to this result as notification. The daily receipt from medical men of reports of zymotic cases that require isolation, which is not being obtained at home, inevitably leads to the provision of hospital accommodation, which otherwise would have been neglected, so that the

absence of hospitals actually becomes an argument for, instead of against, notification.

On the other hand, the existence of hospitals and of sanitary organisation, costly as they are, are comparatively useless without notification; and, indeed, without it the provisions of the Public Health Act, particularly those included in sections 120-143, are a dead letter.

The absence of notification, full and complete, has a relation to the extent and cost of hospital accommodation, which is worthy of notice. For instance, supposing every case of disease be reported as soon as made out, the first cases would receive proper attention and isolation, the disease would be nipped in the bud, and a very small hospital would suffice; but if, on the other hand, first cases are not reported, the stamping-out process fails, the disease rapidly extends and becomes epidemic, and then the most gigantic hospital fails to meet its demands. This relation between notification and cost of hospital accommodation, without regard to other considerations, seems to me a matter of the greatest importance; and the fact should not be lost sight of that the main value of a hospital for infectious diseases is to treat first cases and prevent epidemics, and not to treat thousands of cases which might, with proper care, have been prevented.

In conclusion, I would point out how little can be said against notification, that what is urged against it is, for the most part, of a hypothetical and speculative character, and that its principal opponents are persons who have had no actual experience of its working. On the other hand, both the public and the medical profession in those thirty-eight towns where it has already been submitted to a practical test, accept it with satisfaction. Would they do this if it proved on trial as objectionable as it was predicted? Why in these very towns medical practitioners, who were at first bitterly opposed to the plan, have, on seeing the results of its operation, ceased their opposition, and have become its most loyal and valuable supporters.

I trust the medical profession is being gradually educated up to a proper appreciation of its value, and to a becoming sense of their duties with regard to it. It would be a subject of the profoundest regret to find them in prolonged antagonism to a measure which is necessary to the public good, as has already been abundantly proved.

Such opposition can only be based on mistaken views with regard to the influence of notification on public health, on strictly professional interests, or on sentiment. It is clear that the first is benefited by it, it would be difficult to show that the second would be in any way prejudiced, and the third ground requires no serious consideration. The medical profession is, I am sure, too noble and too generous in its aims to let mere sentimental objections or considerations of self-interest, or a false professional *amour propre* stand in the way of the public weal. We are the servants and not the masters of the public, and it has been usual to regard our profession as the most philanthropic, benevolent, and self-sacrificing of all; but I fear that a continuance in opposition to a great sanitary step forward is calculated to jeopardise its reputation, and not the less so because while a section of the profession is hanging back, the practical common-sense and prudence of the nation at large, as shown by the action of a considerable number of towns already, will step in and do the work without its assistance.

RIGHT OF THE STATE TO EN- NOTIFICATION, AND THE METHOD OF DOING IT.*

ALFRED CARPENTER, M.D., J.P.,
Chairman of Council of Sanitary Institute.

AS I do in the main the observations of Dr. Hill as to the necessity for early notification, I wish to point out some of the difficulties which are in the way of doing it as they are given by some earnest sanitarians, and at the same time to give a short history of the progress which has been made in that direction. I agree with the proverbial statement that 'a spark is of matter which may kindle a world,' and that the great object of the sanitary world is to prevent the presence of that spark before it reproduces its kind, and that the method which will give the most complete and efficient in practice will be more satisfactory than which may be perfect in theory but for reasons not so efficient in action. The first method as to method came from Manchester when the Manchester Sanitary Association did twenty years ago which the Society of Medical Officers of Health suggested as the best but failed to do it for want of funds, the day refusing to help them in their efforts. The Manchester Association published a list of all new cases of diseases coming in at the various medical institutions in Manchester and Salford. The sanitary section of the International Statistical Congress held in the year 1875 had considered the subject and had decided the method of doing it. The congress decided as a duty upon governments to get the information in the usual way, and pointed out that the method as to the position of the onset of diseases of more importance than were the actual mortality, a principle which I had at various local meetings held for sanitary notification before the congress alluded to. The returns gave timely warning of the foci where it might be expected that infectious diseases would spread, as spread they did. Manchester without Government assistance, did that on which was unable to do. Attempts were soon made on different parts of the kingdom to provide notification, but they were only 'flashes in the pan,' not persistent. The late Dr. Lankester brought the matter to the notice of the Social Science Association on June 5, 1871, at their rooms in the Strand, Dr. W. Farr being the chairman at that time. Dr. Lankester urged that the State should be responsible, as regards those children who were vaccinated, and that a Court of Summary should have them vaccinated in spite of refusal and that heavy fines should be inflicted on medical men who attended cases of small-pox and not at once notify to the local authority of its presence at that particular place. The first suggestion made in a general meeting of his country, that a penalty should be put on the medical man for not notifying to the local authority the fact of the fire, although it had been suggested that the local authority ought

to be fined for allowing the fire to extend itself. I had urged this view because the foci of disease could not become persistent if the local authority did its duty, and insisted upon local cleanliness, with the generous distribution of a pure water supply.

The subject of notification of small-pox, upon the motion of the late Dr. Stewart, was referred to the Committee of the Health Department of the Social Science Association to consider and report upon, as to what steps could be taken to effect the desirable object of stamping it out. It was discussed and re-discussed at the Congresses of that association without any satisfactory result. At Brighton, in 1875, it was resolved to recommend the Council to take into consideration the desirability of promoting by legislative enactment that all cases of an infectious character should be reported to the medical officer of health of the district, but to meet objections made in the meeting the reporter was not distinguished.

Dr. Littlejohn is said at that meeting to have strongly opposed the resolution as it stood when first considered, viz. 'that it should compel medical men to report.' He said veterinary surgeons were not called upon to send certificates under the Contagious Diseases (Animals) Act to the county authority, and he considered that it would be 'invidious and monstrous to throw such a responsibility upon medical men, instead of casting it upon the man of the house where the case took place.'

In the same year, 1875, the North Western Association of Medical Officers of Health memorialised the President of the Local Government Board, in favour of putting medical men in a criminal position if they did not report to the local authority any case they might be called upon to attend. The subject was again publicly discussed in London on April 29, 1876, when, at the request of the Health Committee of the Social Science Association, I read a Paper upon the right of the State to obtain early information of the appearance of epidemic or infectious disease in a given district. I discussed whether the medical attendant ought to be the informant or not. In that Paper I dealt with the subject from its various aspects, *pro* and *con*. A very careful consideration led me to conclude that there were even more than two sides to the question under consideration, and that it was not so absolutely one-sided as the Social Science Association and Northern Medical Officers of Health Society at their various meetings seemed to think. The Chairman (Dr. W. B. Richardson), in summing up, said that in the discussion four distinct views had been enunciated.

1. That the duty should be absolute upon the medical attendant under a penalty for neglect.

2. It should be upon the legal representatives as head of the family, or of the household in which the case occurred.

3. That there should be a dual notification, that is notification by both parties. Whilst the 4th made it the duty of the medical attendant to inform the head of the household in writing as to the infectious character of the disease, which information the householder should be bound, under a penalty, to transmit to the local authority.

Each project had been supported in the discussion by about an equal number of speakers. The last view was the system advocated in my Paper, and is the plan which, to my mind, was most likely to effect the object we all had in view.

The divided councils at Adam Street did not get

* at the Conference organised at the International Sanitary Convention, by the Society of Medical Officers of Health, the Sanitary Institute of Great Britain, and the Parkes Museum of Hygiene, 1884.

the matter settled. It was again taken up by the Society of Medical Officers of Health, and at a meeting held December 15, in the same year, certain resolutions were proposed; and after several suggestions and amendments had been made, it was unanimously resolved that—

1. Infectious disease ought to be reported by the householder to the sanitary authority without delay.

2. Every medical man attending a case of infectious disease should give immediate information respecting its nature to the occupier or other person responsible for reporting to the sanitary authority.

It does not appear from the report of the discussion at that meeting, which was presided over by Dr. Buchanan, that any proposal was made that medical men should be subject to a criminal prosecution if they did not disclose the nature of the disease to the householder, much less suggest that they should be criminally prosecuted if they did not do so to the local authority. The Chairman, in summing up the discussion, said he thought it the duty of the society to affirm the principle, without, however, making it compulsory under penalty upon the medical profession to give the sought-for information. He (Dr. Buchanan) felt persuaded that as soon as the profession found itself morally bound to do a thing, there would be no ground for suspecting any evasion of the duty even although there was no legal compulsion.

The Parliamentary Session of 1876 witnessed the introduction of clauses in Local Acts giving the power to the local authority of prosecuting medical men who did not notify the existence of such disease to the local authority. Huddersfield introduced such a clause, which inflicted a penalty not exceeding 10*s.*, but which was partial in its application. The subject was handled in a masterly manner at the annual meeting of the Social Science Association at Liverpool in 1876 by Dr. Francis Bond, who argued in favour of the householder being the informant under a penalty, and that medical men should make the communication to him as a moral duty.

In the following year the Town Council of Coventry passed resolutions having the same effect as indicated in the course which Dr. Bond had suggested at Liverpool, and Dr. Ransome urged the same course as essentially necessary in a paper which he read to the National Health Society in May 1877.

About the same time the North-Western Association of the Medical Officers of Health again approached the President of the Local Government Board, but this time they suggested that the householder should be the informant, and that the medical attendant should be liable to a penalty if he did not disclose the nature of the case to the householder or person responsible for the care of the patient. Memorials were also sent to Mr. Sclater Booth by various sanitary authorities calling upon him to introduce a measure into Parliament for the purpose of effecting legislation in the direction thus indicated.

A further step was also taken by the town of Bolton, which obtained a clause in an Act of Parliament putting a penalty for non-disclosure upon both householder and doctor, the doctor being liable to a penalty not exceeding 10*s.*, but entitled to a fee of 2*s.* 6*d.* for notifying.

A temperate and well-written paper on the subject was read at York in July 1878, by Mr. North, to a

combined meeting of medical officers of health for the Northern, Western, and York Societies, in which the difficulties to be encountered by compulsory notification were placed before the members. It did not convince the various medical officers of health assembled at that meeting. They found themselves so often foiled in their endeavours to arrest disease because foci had been conveyed to many places before information reached them as to its existence that they still insisted upon going to the fountain-head for the information, in all those cases at least which came to the cognisance of the members of the medical profession. The advantage and saving of trouble by this course to medical officers cannot be doubted, and if all cases of infectious disease were attended by medical men as a matter-of-course, it would, if carried out efficiently, do what the medical officers require; viz, give them intelligence as to the whereabouts of dangerous infection. But no one can read the reports of the medical officers of health from all parts of the kingdom without coming to the conclusion that the greatest spread of infection is brought about by those cases which are not under orthodox medical care at all, and that notification by the medical profession alone would not effect the object, but rather lead to ignorant attempts to smother up the evidence, and in the end to raise more persistent, and more widespread outbursts. There was a necessity in the minds of medical officers of health for dual notification; and all the Local Bills introduced into the House of Commons in this and succeeding years, contained clauses requiring the medical attendant either with or without the householder to notify to the local authority under penalties.

In 1879 the Local Government Board also made a step in advance by an order dated February 12, which imposed the duty upon all medical officers employed by them of notifying any case of dangerous, contagious, infectious or epidemic disease to the sanitary authority of the district immediately upon its occurrence; it also enabled medical officers of health to obtain such information as to sickness and death among pauper patients, as might be thought necessary for their guidance; and later in the year the order was made to extend to the medical officers of district schools.

I now refer to the action of the British Medical Association, and to give credit to those to whom it is due. The first note was sounded by that body soon after Dr. Ransome had moved in the matter at Manchester, for he introduced the subject to the notice of the Association at Leamington in 1865, and procured the appointment of a committee to consider the registration of disease. Various reports were made by that committee, and in 1875 it was distinctly stated that the authoritative declaration of the nature of the disease must necessarily come in the first instance from the medical attendant; but the committee also expressed their opinion that the proper individual to make return should, in the first instance, be the householder, or the person in charge of the case. I had dealt with the matter in this direction in the address upon public medicine which I had the honour to read at Sheffield in that year. The subject was then referred to the Parliamentary Bills Committee, and voluminous reports have been presented from time to time, and accepted by the Association, and the moral duty of communi-

ating that information to the householder has been often insisted upon. The report of the chairman of the committee (Mr. E. Hart) upon the subject is a masterly *résumé* of the action of the committee, and could be studied by all who take interest in the matter. A discussion took place at Ryde in 1881, when Mr. Michael, Q.C., proposed an amendment to the report, which amendment cast the duty on the medical attendant, and made its neglect a penal act, but which was lost by a large majority.

At Worcester, in 1882, the subject was brought prominently forward both in the Public Health section, of which I was president, and in the general meeting. The result of the discussion which ensued was the overwhelming defeat of Mr. Hastings's resolution which made neglect to report, a penal act, and the following proposal was adopted—'That whilst desiring compulsory notification of infectious diseases, the Association wishes to express its opinion that the compulsion to notify should be placed upon the householder as his duty as a citizen, and not upon the doctor.' The subject continued to be debated in various quarters, and on April 26, 1881, a deputation waited upon the President of the Local Government Board, which was formed by representatives of the British Medical Association, Sanitary Institute of Great Britain, Society of Medical Officers of Health, Social Science Association, National Health Society, and of the Vestries and District Boards of London, to ask the Government to legislate upon this and other subjects connected with measures necessary to guard the public health from the danger of infectious diseases.

One of the sequences of that deputation was the appointment of the Hospitals Commission to enquire respecting small-pox and fever hospitals, the extent and sufficiency of hospital accommodation, and, with other matters, 'to insure as far as practicable the protection of the public against contagion.' Having had the honour of being appointed one of the members of that Commission, I directed my attention especially to this part of the subject, and carefully examined the witnesses who were able to speak with authority upon the matter. The report which we presented to the Queen, states very distinctly 'that notification should in all cases be obligatory upon one or more of the following persons—the patient, those in charge of him, the occupier of the house in which he lodges, his medical attendant or any relieving officer (if a pauper) to whom he may apply for assistance.' In effect, the report says it is only by the medical attendant (if any) that the disease can be intelligently notified, since it is only he who can be presumed to know what it is, and who has no interest in concealing it; but it is represented that to impose that duty upon him directly and undeservedly would interfere with the relation which ought to exist between him and his patient, and might prevent the aid of a medical attendant being sought at all. If this be so, it may be sufficient that the medical attendant should be required by law to furnish to persons in charge of a patient, or the owner or occupier of the house in which he lodges, certificate of the nature of the disease, stating whether proper isolation can or cannot be secured without removal, and when removal is necessary, stating also to what extent the case is urgent or severe. 'The persons to whom this certificate is given should be in like manner required by law to forward it at once to the medical officer of health.

The medical attendant should, we think, in justice be entitled to claim a fee either from the patient or from the sanitary authority for every such certificate of his which reaches the medical officer of health, and which he may forward himself if the patient so desires.

Evidence upon these points was obtained from various societies—such as the Medical Officers of Health, the Sanitary Institute of Great Britain—as well as the numerous witnesses who had personal knowledge of the behaviour of small-pox and other infectious diseases.

I now come to the last phases of this important matter. Mr. Hastings introduced a Bill into the House of Commons for the purpose of putting a private medical man into the position of a criminal if he did not become a State official, whenever he came into contact with infectious disease, whether he was willing to be a State official or not. The Bill came on for second reading on June 27 in last year. The House was counted out immediately after Mr. Hastings's speech in its favour, and the Bill was not proceeded with. The Government had been previously interviewed by Mr. Hastings's followers, but they would not pledge themselves to support a general Act, although pressed to do so by some men who are notably anxious to make the medical profession occupy a secondary position in the country. In October of last year the Social Science Congress held its meeting at Huddersfield. It might have been supposed that after the defeat of the President of their Council on this matter, that as Huddersfield was the first town which obtained the advantages or disadvantages which attach to a penal clause, and is the town in which compulsory notification has been the longest in operation, we should have had a convincing discussion as to the benefits or injury which had resulted to the town from the passing of the Act. It does not appear that a single word was said upon the subject by either side. Mr. Hastings did not raise the point, and no other person said a word about it; and although the Social Science Association had been on former occasions so very positive about its benefits, and were actually meeting soon after their President's defeat in the very town most capable of producing convincing proofs, if they were forthcoming, as to the advantages of the Act; there was a silence on the subject which to me is inexplicable, unless on the view that the results do not correspond with the prognostications, and that it would not have been safe to excite a discussion among those capable of proving the negative.

If towns having the compulsory clauses in operation are not able to show better things than can be shown in those places in which only a moral obligation to disclose exists, I think it must be evident to those who wish to prevent us trusting too much to a paternal Government that we had better steer clear of too much compulsion, and trust a little more to moral obligations. There is a strong feeling in the commercial world against professional men, such as lawyers, commission agents, auctioneers or engineers, accepting a commission from both sides in a given case, and being engaged as advisers for both sides in any commercial transaction; and I fail to see any difference in the case of a man who is employed by a private and responsible individual to cure him of his disease being compelled to accept a fee for disclosing something which may be used by the local authority to the injury of his client and employer.

The object of notification is not simply a registration, but a repression of disease ; and if the repression is brought about, the means whereby the repression is produced is of no consequence. If the fire is put out, it would be curious indeed if the local authorities complained, or asked for the infliction of a penalty upon the person at whose house the fire occurred because they had not been informed of the fact, by the man who had put out the fire, whilst it is certain that when rewards were offered for the discovery of fires, much false information was forthcoming at the fire station. There would be reason in the application if the fire had not been put out and several other premises had also been consumed in the conflagration. It might be reasonable to ask for it, but here again there might be a difficulty if it could not be proved as to the nature of the case, and in which house the fire first appeared. I am curious to know how many certificates have been sent in, reporting cases which turned out after all to be false alarms instead of true reports. If you look into the evidence given to the 'Hospitals Commission,' it will be seen that it was not always clear that a given case was small-pox, or typhus, or scarlatina, or even infectious disease at all.

In some cases it might be important that the medical attendant should be put into the witness-box, as against the householder, but if he is made a *particeps criminis*, his mouth is closed as regards the prosecution ; he cannot be called by the local authority, he cannot be made to convict himself ; whilst if he has not informed his employer as to the nature of the disease (as it is possible to be alleged by that householder in his defence), he would be guilty of a moral wrong which if proved against him would be of much more serious consequence to him than any money penalty, which penalty if inflicted would be certain to be paid by his employer as part of the price of his silence, and as payment for the prosecution which had been instituted against him. If an employer is determined to break the law, and his medical attendant will acknowledge to having committed a moral wrong for the purpose of assisting in the fraud, the same attendant will not disclose, if the employer agrees to hold him pecuniarily harmless. The evil will be as great in the one case as in the other. Whilst the medical attendant cannot be called for the prosecution, he will be able to appear as a witness for the other side, and if he likes to say so can aver that the prosecution is mistaken as to the identity of the case. To my mind it is far better that the local authority should have the moral support of the medical profession than run the risk of having a '*non omnia possumus*' set up by the passive action of a large section of the medical profession in a given town. Whilst the fear that the medical attendant is bound to directly disclose, could not be used as an argument against the employment of an orthodox medical man. If such a man be employed to treat infectious disease, and if the householder does not disclose it, it will be ten times over more to his interest to prevent the spread of the disease which he is hiding up, and in his own interests as well as for his medical attendant's sake, to use the most persistent endeavour to extinguish the disease and prevent any knowledge of it reaching the ears of the local authority in consequence of that extension.

A disagreeable medical officer of health, or the fussy and interfering action of an acknowledged rival, the impropriety and the public scandal of one

medical man taking legal proceedings against another, and that other possibly his superior in social position and in professional standing, ought not to be countenanced by medical men at any rate. However satisfactory it might be to some others that such proceedings should be taken, there will always be in every profession some men who will see in the opportunity of throwing dirt at a professional superior that some of it will stick, and all men are not able to see the motive for the malicious action.

Until all medical officers of health consist of either consulting practitioners or men who are not in practice at all, there certainly will be some who will be able to hide for a time the malicious character of their action, and try to injure another man's reputation for the purpose of establishing their own, not seeing that if their own is not capable of being established without the other man is damaged, they are proving their own littleness, and their own incapacity to excel their neighbour in the estimation of the people simply by professional work. I am very much opposed to placing any such power in the hands of professional rivals. The method by which action may be taken is so likely to be moved by motives out of sight ; men will so often try to pose as energetic and self-denying officers, and are but too often able to inflict undeserved damage upon a rival practitioner before the real motive is seen, that I for one set my face against the new departure which is being made in this direction ; and I aver that we do not want too much of compulsion in our sanitary work. It does not follow that a despotic government will always be benevolent. It is found by experience that as good results have been obtained in districts in which notification is voluntary, as in those places in which it is compulsory ; indeed the incidence of infective disease is higher in Huddersfield, in Bolton, in Edinburgh, and in Dundee, than it is in a number of places in which there is no compulsion upon medical men, showing at once that compulsion has not extinguished the diseases which are proposed to be stamped out by it. If those towns could show that the disease had been completely arrested by the power they possess, there would be grounds for argument in favour of the extension of compulsory notification to other places, but whilst the cases continue to be nearly, if not quite as numerous, whilst the mortality continues to be considerable, it is evident that there is much more to be done by the local authority in removal of the causes which promote the spread of infection, than simply by enforcing professional notification ; and whilst ready to concede that the householder ought to notify as a part of his duty as a citizen of a civilised country, I think it would be much more likely to bring the whole force of the profession to bear upon the subject if it was insisted upon as a moral duty to the State, that a written notice should be given by the medical man to the householder as a part of his prescription. I would rather that the neglect to perform a moral duty should be dealt with by the medical licensing authorities or by the Medical Council than it should be made a penal matter to be dealt with in a court of summary jurisdiction by those who will not always be able to see the motive for the prosecution or the medical bearing of the case, and the possible differences of opinion which will sometimes arise, and which will be best dealt with by men of high standing in the medical profession. Let us try to get a general Act which shall apply the same law as to infectious

disease as does now apply to contagious diseases among animals. Let us see the result of the general application of such a law, and if after a time it is found to fail in its effect there will then be a sufficient reason for placing penalties upon a whole profession for not performing that which can only be regarded in the light of a moral duty. To place a power of prosecution, even under such circumstances, in the hands of a fellow-practitioner would be wrong, and I should urge that in such a case a prosecution should only be instituted with the consent and by the action of the Medical Council of Great Britain, so as to get rid of the possibility of professional rivalry, and vindictive or malicious action on the part of a professional brother. I am bound to say that the medical officers of health have not used the power they possess against their professional brethren in the twenty towns which have now a compulsory clause, and it is much to their credit that penal proceedings have not been taken by them, but they have also to show that if it were penal on the householder only, as a citizen of the commonwealth, it would not have been so effectual as they say it has been. I think it would have been equally so, and that the same results would have been obtained in the one case as it is assumed to have been obtained with the dual notification. The fear which does arise among the people, that medical men will be informers against the patient's interest could not have any foundation, and we should not find so many cases reported which have not been recognised by an orthodox practitioner, because they have not been placed under any medical man's care.

THE SANITARY AND INSANITARY HOUSES AT THE HEALTH EXHIBITION.

By HENRY M. MAVOR.

THE preparation of these houses has been considerably delayed owing to a variety of causes beyond control; but now, fortunately, they are fairly complete, or at least sufficiently advanced to invite a careful inspection, not only from those who have a thorough knowledge of the subject, but also those to whom sanitary matters are more or less of a mystery. It is perhaps as well that the delay has taken place, as the opening of this exhibit should give an impetus to, or further interest in, a study which is fast becoming general; and the sanitary appliances and different kinds of apparatus scattered throughout the other parts of the Exhibition prepare the untechnical mind for the continuity of principle here shown. It will be understood that these houses have been specially erected to place before the public in the simplest manner a contrast between good and bad sanitary arrangements of an ordinary dwelling-house, and the actual working in every-day use. There has been no attempt to exaggerate the defects of the old system, but merely to bring before the public specimens of common errors to be found in the majority of homes, and from which errors many of the best built and most sumptuously fitted houses are not exempt. To render the comparison more easy, the various arrangements are disclosed to view in such a way that the important points are clearly seen, and legibly printed and numbered labels arrest the attention. As a contrast, the sanitary house has examples of approved forms of construc-

tion and principle, in addition to which other points bearing upon health are illustrated, such as electric lighting, ventilation, floor construction, and other matters.

Entering by the basement of the insanitary house a large dust-bin is noticed, being a portion of the area framed in. This, of course, means that it is a fixture, and as such it cannot be readily emptied, much less cleaned. The arrangement as it should be is shown in the area of the sanitary house as a galvanised iron bin, which holds only a small quantity of refuse, thus necessitating its frequent emptying, and, being movable, this is easily done. The condemned 'bell-trap,' communicating directly with the drain in the area, and a similar form of construction to the scullery sink, are here to be seen, and, of course, forbidden. The damp walls point to the want of a 'damp course,' and the uselessness of an improper material, such as tarred felt, which soon decays, is adverted to. The floor joists are here resting on the ground, and, as everybody knows, there can be but one result to this. At the same time the drains are disclosed to view, the stoneware pipes being jointed in clay, and the objections to this material will be pointed out, such as the impossibility of making a water-tight joint, and the liability of being washed out or squeezed out. A very usual error of laying some of the branches at right angles thus causing stoppages, to say nothing of bad jointing, is then noted. The point next emphasised is No. 10, which shows an arrangement which we fear is only too prevalent, that is, a cistern for drinking purposes, supplying also a servants' water-closet, and a tap over the scullery sink. The overflow pipe discharges into the drain, it is placed in an inaccessible position, and it runs the risk of receiving the leakage or overflow from a water-closet immediately over. When these many evils are shown in conjunction, and are known to exist, it will surely induce owners and tenants to put their houses in order. The faulty construction of an inside soil-pipe is given, the joints being only partially filled with putty, the foot of this soil-pipe being connected with the drain by a right-angled junction, and not as it should be by an easy bend: an accumulation would naturally occur here with direful results. The drain is continued and cut off to form a 'dead end,' which would allow of a permanent lodgment of filth, or, what would be worse if it became unstopped, the basement would become gradually overrun. It is nothing uncommon to find, even in large houses, a water-closet in the middle of the building, without light or ventilation, and an instance is given here combining faulty apparatus and insufficient flushing arrangement. The following ordinary form of drain is illustrated:—Stoneware pipes 6 inches in diameter, badly jointed in cement at the top, but open at the bottom, laid, as is constantly done, to an insufficient fall, and with no trap between the house and the sewer. A gas stove, without provision for carrying off the vitiated air, points to a trouble not unknown, and reminds one of the charcoal braziers in use on the Continent, the fumes from which occasionally lead even to loss of life. Ascending to the ground-floor we find another water-closet in a bad position with the pan apparatus and the inevitable D-trap, this being the one, as before described, over the cistern in scullery. As there are still many advocates for the use of the lead D-trap, we would advise them to stroll round the Exhibition and see

some of the specimens of the apparatus which have recently been taken from different quarters, and these clogged and corroded examples may at least cause them to hesitate. Not content with this form by itself, the plumbers of old often connected the other services with it, and the lavatory and bath are here shown in communication, and defy contradiction. A notice on the wall brings to mind the former use of arsenic in the colouring matter used in wall-papers, for although it was known that this substance was required, or supposed to be required, to produce a good green, it was presumed that other colours were exempt from it, but it was and is news to many minds that it was used nearly all round. In the insanitary house these arsenical papers are used throughout, the reverse being the case in the other example. The rain-water pipe being connected with the soil-pipe shows again a mistake of which the danger is often underrated, mostly arising from a false sense of economy, and occasionally the argument is adduced that it helps to flush the drain, forgetting that the drain may in a sense flush the pipe—with sewer gas. Any hole or corner is supposed to be good enough for a housemaid's sink, and we are shown one badly placed—no light or ventilation, and connected with a water-closet. The bedroom water jugs and bottles would be filled from a tap deriving a supply from a cistern also in connection with a water-closet—nothing unusual in this. Matters are not mended when we see the bath service introduced into the generally faulty system, and the 'last straw' is arrived at on finding the cistern in the roof impossible to get at, and communicating 'all round,' supplying anything or everything, if, by doing so, a few feet of piping may be saved.

So much for things as they are. In the sanitary house we find them mostly reversed, but with the addition of many points which the old principles were not able to contain. We are first asked to look at a simple method of ventilation which consists of making the bead on the window-sill two or three inches deeper than usual; then by slightly raising the lower sash air is admitted at the meeting-rails only, and passes into the room in an upward direction, avoiding draught. A funnel and tube over the gas brackets form an efficient means of carrying off the products of combustion, taking the vitiated air through the wall to the exterior. A point of great importance, yet easily managed, is to place the cisterns in a space adapted for the purpose, where they can be easily examined, as exemplified here. A separate cistern is used for drinking purposes, with an overflow passing through the outside wall discharging into the open, so there is no connection with any drain in any way. On the supply-pipes are fixed stopcocks, so that the water may be shut off at any part to enable repairs, &c., to be made without interfering with the remainder. The usual winter trouble of a 'burst pipe' can be avoided by adopting a draining-tap (No. 77), by which the 'main' can be emptied, and much annoyance saved to the householder. The water-closets in this house are well lighted and ventilated, the valve apparatus, such as shown by many makers, being used in one case, and also an improved 'hopper,' with a flushing rim all round the basin. It is needless to recapitulate the many improved forms here in use; suffice it to say that types are to be found by the score throughout the Exhibition, but they have a double value and meaning when

placed *in situ*; but there is one point which is not always to be seen, viz., the 'inspection chamber' (No. 100), which allows of an easy mode of access for inspecting and cleansing the drains, which are continued through the floor of the chamber, with open-glazed stoneware channels, the drains entering these channels being four in number—viz., surface water, waste water, soil-pipe, and w.c. in basement. The soil-pipe, of course, is carried up the full size above the roof as a ventilating pipe, and a through draught is obtained from the manhole in the front area.

DEEP DRAINAGE AND SEWAGE PURIFICATION IN THE BLACK COUNTRY.

(FROM OUR OWN CORRESPONDENT.)

[First Article.]

THE question of deep drainage and sewage purification has now for some years been occupying the more or less serious attention of the various local authorities in the large and populous section of the Midlands, known as the Black Country. Scientific opinion has long recognised the fact that the supply of pure water, efficient drainage, and improved knowledge and habits of sanitation effect a salutary reform in the moral and social life of the inhabitants of populous centres, and public opinion has within the last few years come to recognise the importance of such conditions and to urge their fulfilment. Birmingham was about the first in this part of the country to take active measures in this direction. But though they have done a great deal, especially in regard to the interception and purification of sewage matter, they have yet a great deal to do before the town can be considered in a thoroughly satisfactory condition. Wolverhampton and Walsall have likewise accomplished much in the same direction, and at the present time most of the urban sanitary districts within the catchment basin of the Upper Tame are either engaged in carrying out schemes of sewerage, or in the preparation of such schemes. Deep drainage is even now a thing almost unknown in the practical experience of the district, and the difficulties in the way of its accomplishment are so many and so great, that one is not much surprised to find the question shirked as much and as long as possible.

The passing of the Rivers Pollution Prevention Act in 1876 largely assisted in bringing matters to a crisis. By sect. 30 of the Birmingham Waterworks Act of 1866, provision was made as to the use of the Tame as a source of water supply by the Birmingham Waterworks Co., also limiting the quantity of water to be taken therefrom, with, however, power of free use of the water in case of emergency, such as long continued frost, drought, or other unavoidable accident, or in the event of the water being certified by the Board of Trade to have become pure and fit for domestic purposes. When the Birmingham Corporation took over the water supply of the town the powers given in the Act were transferred to them, by virtue of the Corporation Water Act of 1875. It is thus easy to see how important a matter it is to Birmingham that the River Tame should be kept free from sewage contamination, and the great assistance the enforcement of the Rivers Pollution Prevention Act would be to them in this direction.

How difficult an object the purification of the River Tame is to accomplish under present conditions may be gathered from the fact that a great part of the sewage of some twenty parishes, with more than 100,000 population, passes into it. From Wallall alone, for instance, above a million and a half gallons of unpurified sewage were emptied daily into the Tame previous to carrying out of sewerage works here. The volume of the river at the point of entry of this quantity of filth is comparatively small, quite inadequate to render it innoxious, and before it became inoffensive it would be carried through the parishes of Great Barr, Perry Barr, Hamstead, West Bromwich, Handsworth, Aston, and the district under the control of the Birmingham United Drainage Board. As we have said, the passing of the Rivers Pollution Prevention Act brought matters to a crisis. That Act provides that every person (including Corporate bodies) who knowingly permits to flow into any stream any solid or liquid sewage matter, shall be deemed to have committed an offence, rendering him or them liable to a penalty of 50*s.* per day. It will readily be seen that such a stringent provision came as a boon and a blessing to the authorities charged with the water supply required for the 400,000 inhabitants of the Midland metropolis, and they lost very little time in giving the offending authorities along the banks of the Tame notice that they must cease to pollute the stream or its tributaries with sewage, or they, as proprietors of the water rights, would have recourse to legal measures for the enforcement thereof. This notice was sent out after the twelve months' grace allowed for carrying out the requirements of the Act had expired, to the whole of the districts the natural drainage of which washes into the Tame or its tributaries. Some of the local authorities also received other and minor notices of a similar character from persons having, or claiming to have, a right to use the stream for various purposes. But the powerful and wealthy Birmingham Corporation was the body to be dreaded, and the local authorities were speedily on the *qui vive* as to what was to be done. There were two courses open to the delinquents, either to withdraw the sewage from the stream altogether, or else to avail themselves of the 3rd section of the Act, which provides that, 'where any sewage matter falls, flows, or is carried into any stream along a channel used, constructed, or in progress of construction, at the date of the passing of the Act, for the purpose of conveying such sewage matter, the person causing or knowingly permitting the sewage matter so to fall, or flow, or to be carried, shall not be deemed to have committed an offence against the Act if he shows to the satisfaction of the Court having cognisance of the case that he is using the best practicable and available means to render harmless the sewage matter so falling, or flowing, or being carried into the stream.' Fortunately for the authorities, in addition to the twelve months' grace allowed from the passing of the Act to enable public bodies who were permitting sewage to pollute a stream to adopt the necessary measures for complying with its requirements, an extension of the period of freedom from prosecution could be gained on appeal to the Local Government Board, if sufficient cause was shown or disposition manifest on the part of the applicants to carry the law into effect at the earliest possible period. The Walsall Corporation was one of the first bodies in this dis-

trict to recognise the gravity of the position, and to take active measures to comply with the terms of the notice served upon it by the Birmingham Corporation. But most of the authorities were very lax. They dreaded to face the difficulties to be encountered in carrying out an efficient scheme of sewerage. They also dreaded the large expenditure that would be required, and the effect it would have upon the rates—and ratepayers. Notice after notice has been sent out from Birmingham, with dire threats of penal consequences, and it was only upon the actual commencement of legal proceedings, or the fixing of a date when such proceedings would be instituted, that some of the Local Boards really and earnestly bestirred themselves in the matter. In some parts of the district an attempt was made to compromise the difficulty by passing the sewage through filter-beds or over sewage farms in a crude fashion. But the Birmingham Corporation, as the parties most aggrieved, declined to accept this temporising with the matter as a final or satisfactory settlement, and pressed for some real and effectual remedy. In the end the authorities have found themselves compelled to go in for more or less elaborate and costly schemes, and also to apply for the protection of an order from the Local Government Board to relieve them from the fear of prosecution while endeavouring to carry those schemes into effect.

Another important factor in the consideration of sewerage schemes in the mining part of the district is the important body known as the South Staffordshire Mines' Drainage Commissioners. The wave of prosperity in the iron trade of the district, which set in during the years 1872-3, caused the mining resources of the district to be subjected to somewhat careful examination, with the result of proving that there was still within it a vast quantity of ungotten minerals which might be reached and utilised if water in the mines could be successfully dealt with and got rid of. An Act of Parliament was obtained in 1873, which has been supplemented by others passed in 1878 and 1882, by which power was given to form a Commission under the above-mentioned title, and to levy rates on the minerals raised for enabling them to carry out a comprehensive plan for dealing, first with the drainage on the surface, and then with the draining of water-logged mines. This was a gigantic task, beset with many and almost insurmountable difficulties. The district is not to any appreciable extent watered by springs from the surrounding hills; but in addition to the rain water there was the constantly-recurring difficulty to be dealt with of the water from the numerous canals which intersect the district, finding its way into the mines through defective works and leakages. This water, a very serious quantity, finds its way into the workings, and has all to be pumped up to the surface—in addition to the accumulation from this and other sources—and conveyed away in the watercourses, which it was the first duty of the commissioners to provide. The position of this Board may really be said to be that of an authority provided by Act of Parliament to take over, maintain, repair, widen, and deepen all existing watercourses within the area of their operations, with power to make others where required, and to compel all parties raising or disposing of water by any means to take due care that it was conveyed into one of those courses, which would carry it to the confines of their area. While they are not an

authority to put in force the Rivers Pollution Prevention Act, they regard themselves as conservators of streams, with power to enforce riparian rights, and also to call upon mine-owners to maintain the water-courses at their proper levels, and to take due precaution against the water escaping therefrom into the mines. For nearly ten years the Mines Drainage Commission has been at work, with the result that after an expenditure of some 300,000*l.*, although the water is gradually sinking, the drainage of the mines is still very far from complete. As the chairman of the Board said but a short time since: 'It was only within the last few months that they had been able to say that the general drainage or surface works were in a sufficiently finished condition to enable them to trace accurately and definitely where pollution was turned in upon the works, or to point out the exact injury which the road *detritus* was doing in the way of filling up the commissioners' watercourses.' These watercourses have cost the commissioners a quarter of a million sterling, and as they are the only means by which the storm water can be kept out of the mines, and by which the water pumped therefrom can be conveyed away, their pollution becomes a grave and serious question which is affected in no small degree by the action of the several local authorities in the carrying out of their respective sewerage schemes. The commissioners can scarcely be blamed therefore for looking to the interests of their own undertaking, and seeking to prevent any interference with or encroachment upon what has cost them so much time, labour, and money to achieve. With this end in view, as also, no doubt, with an idea of furthering them in their work, the commissioners have recently formulated a scheme for combined drainage operations, by which the local authorities would unite with the commissioners in perfecting the surface drainage of the district, and carrying out in conjunction therewith one general sewerage scheme. It was claimed for such a project that the saving to the district, compared with the carrying out of a separate scheme by each local authority, would amount to something like a quarter of a million sterling. On the other hand, something very much in the nature of threats were shadowed forth as to possible action on the part of the commissioners to prevent the *detritus* carried by storm water from entering the streams and watercourses under their control. Several meetings and conferences on the subject have been held, but without eliciting from the commissioners any definite plan upon which a scheme of such magnitude could be effected. There is no doubt if a workable scheme could be prepared, and all the local authorities could be induced to sink their several individualities and consent thereto, a considerable saving would be effected, especially if the commissioners insist upon and have the power to enforce the clearing of storm water from *detritus* before it enters the streams and watercourses, as this would, perforce, involve the inclusion of storm water in every local sewerage scheme, and thus in many cases largely swell the cost. But no such scheme has yet been defined, nor is it feasible that the various interests involved would ever be got to harmonise sufficiently to allow a work of such magnitude to be carried to a successful issue. The local authorities are inclined to doubt the power of the commissioners to compel them to deal with the storm water; and at a conference of representatives of the local boards and town councils of the district,

convened about a month since for the consideration of the question, a resolution was unanimously arrived at that 'in the absence of figures showing how the estimated saving of 250,000*l.* is arrived at, and of the draft of the Bill setting forth the position, liabilities, and benefits to the local authorities under the commissioners' scheme, the meeting was not prepared to recommend the various local authorities to take any further action in the matter.' And at this stage this phase of the question of the sewerage of the Black Country remains at the present time.

In order to the understanding of the difficulties attendant upon the carrying out of deep drainage and the disposal of sewage in this district, it is also necessary to consider the physical formation of the country. The district popularly known as the Black Country occupies the south-eastern end of the county of Staffordshire, and takes in a small portion of the northern end of the county of Worcestershire. The greater part of it drains naturally by the River Tame into the Trent, and thus into the Humber and the German Ocean. The places affected are Aldridge, a portion of Aston, Bilston, Bloxwich, Brownhills, Coseley, Darlaston, a portion of Dudley, Great Barr, a portion of Handsworth, Oldbury, Pelsall, a portion of Rowley Regis and Sedgley, Tipton, Rushall, Walsall, Wednesbury, a portion of Wednesfield, West Bromwich, Willenhall, and a portion of Wolverhampton. Some of these places belong to the mining district and some to the rural district. The area of the mining district is about 52½ square miles, and of the rural district 40 square miles. The district is composed of three main divisions of rocks—the new red sandstone, the permian, and the carboniferous. The bulk of the district lies for the most part upon the carboniferous group of rocks, and a great part is included in the coal measures of these rocks. The annual rainfall of the district varies from twenty-five to thirty inches in that part including Bilston, Coseley, Dudley, Oldbury, Sedgley, Tipton, Wednesfield, and Wolverhampton, to between thirty and forty inches in the other part. The position of so large a portion of the district in relation to the carboniferous rocks has to be borne in mind in practically dealing with the question of sewage disposal, inasmuch as the clay surfaces of the coal measures act so differently to the porous surfaces of the new red sandstone or the permian, being comparatively impervious to percolation, and therefore more advantageously made serviceable for the drainage of surface water. At the same time, the difficulties of dealing with deep drainage and sewage purification are greatly enhanced not only by the honeycombed and rotten nature of much of the ground that would have to be passed through, but also by the expense of acquiring land containing minerals—whether ungotten or in course of working—for the purposes of intercepting and outfall sewers, and for the treatment of the sewage when collected by most of the methods in vogue.

Having now set forth how the question has been brought into prominence, and how it is the local authorities have been compelled to take active measures for effectually dealing with it, as also the many and serious difficulties by which it is beset, we propose in succeeding articles first to say something about what Birmingham itself has done in this direction; and then to point out the nature of the several schemes proposed in various parts of the district, with the probabilities of their successful accomplishment.

REGISTRAR-GENERAL'S LAST QUARTERLY RETURN.

By J. HAMPDEN SHOVELLER.

arterly return of marriages, births, and in England and Wales has just been issued by the Registrar-General. The statistics relating to marriages for the first quarter of this year, and relating to births and deaths are for the three months ending June last. The marriage-rate showed a considerable decline from that recorded in the corresponding period of the previous year; the birth-rate and the death-rate were below the average. In temperature during the quarter at the Observatory, Greenwich, was 52°·5, and exceeded the average for the corresponding period of 113 years. The rainfall amounted to 4·31 inches, which was one inch and a half below the amount.

In the first quarter of 1884 the marriages of persons were registered in England and Wales equal to an annual rate of 12·3 per 1,000 of population, estimated by the Registrar-General at more than twenty-seven millions of persons.

This marriage-rate was 1·0 per 1,000 below the rate recorded in the first quarter of 1883, and 0·7 below the average rate in the corresponding periods of the ten years 1874-83.

Of the 231,149 children were registered in England and Wales during the second quarter of 1884, equal to an annual rate of 34·2 per 1,000 of the estimated population. This birth-rate was less than that recorded in the corresponding period of any year since 1869. In the several years the birth-rates ranged from 26·4 in Rut-

land, 27·5 in Herefordshire, and 29·1 in the metropolitan portion of Surrey, to 39·7 in Hampshire, and 41·7 in Durham. The 231,149 registered in England and Wales during the second quarter of 1884 exceeded the deaths by 11,000, which represents the *natural* increase of the population. From the Board of Trade returns it appears that 120,102 emigrants embarked during last quarter from the various ports of the United Kingdom, which emigration officers are stationed at, among those whose nationality was undisputed, and excluding foreigners, the emigrants whose origin were 92,451, including 46,345 Scotch, and 38,252 Irish. The proportion of British emigrants to a million of the total population of the three divisions of the Kingdom were 1,708 from England, 2,031 from Scotland, and 7,723 from Ireland. Compared with the corresponding quarters, the proportion of emigration last quarter showed a decline in each of the three divisions of the United Kingdom.

From the returns published by the Local Government it appears that the average number of paupers on the last day of each week in the quarter ending June last was 696,931, of whom 173,749 were in receipt of indoor and 523,182 outdoor relief. The number of the population in receipt of pauper relief showed a further decline from that recorded in the corresponding periods of the two preceding

quarters. The deaths registered in England and Wales during the second quarter of this year were 127,946, equal to an annual rate of 18·9 per 1,000 of the estimated population. In the second or spring quarter of 1881 the death-rate was so low as 18·6;

with this exception the death-rate last quarter was lower than that recorded in any spring quarter since civil registration was established in 1837. This low rate of mortality last quarter implies that upwards of 16,000 persons survived the three months who would have died had the death-rate corresponded with the average rate in the same quarter of the forty-six preceding years. In the various counties the death-rates ranged from 14·3 in Sussex, 14·7 in Huntingdonshire, and 15·4 in Berkshire, to 20·6 in Staffordshire, 21·8 in Lancashire, and 22·1 in Cornwall. In the principal urban districts comprising the chief towns, and containing an estimated population of nearly sixteen millions of persons, the death-rate last quarter averaged 20·0 per 1,000; in the remaining and chiefly rural population of about ten millions and three quarters of persons, the rate of mortality did not exceed 17·3. These urban and rural rates were respectively 1·3 and 1·7 per 1,000 below the average rates in the ten preceding corresponding quarters.

In twenty-eight of the largest English towns, including London, and having an estimated population of more than eight millions and three quarters of persons, the death-rate during the quarter under notice was 20·8 per 1,000, and exceeded by 0·8 the general urban rate. While the death-rate in London did not exceed 19·9, it averaged 21·6 in the twenty-seven provincial towns, among which it ranged from 16·1 in Brighton, 16·8 in Derby, and 17·2 in Bristol, to 24·9 in Wolverhampton, 25·5 in Manchester, and 25·6 in Oldham. The rates of mortality at different ages in these towns varied considerably; it may be noted that the death-rate among infants in the twenty-eight towns, measured by the proportion of deaths under one year of age to 1,000 births registered, ranged from 82 in Brighton, to 175 in Oldham; that among persons aged between one and sixty years the rate of mortality did not exceed 9·2 in Derby, whereas it was equal to 17·3 in Oldham; and that among persons aged upwards of sixty years, the death-rate ranged from 61·1 in Norwich to 99·2 in Bolton.

The 127,946 deaths in England and Wales last quarter included 28,001 of infants under one year of age, 66,629 of children and adults aged between one and sixty years, and 33,316 of persons aged sixty years and upwards. Infant mortality was equal to 121 per 1,000 births, and was below the average of the ten preceding corresponding quarters. In the twenty-eight great towns the proportion of infant mortality averaged 137 per 1,000 births; it did not exceed 131 in London, but averaged 142 in the twenty-seven provincial towns, among which it ranged from 82 and 92 in Brighton and Birkenhead, to 165 in Preston and 175 in Oldham. Among persons aged sixty years and upwards, the rate of mortality last quarter in England and Wales was below the average.

The deaths registered in England and Wales during the second quarter of this year included 3,603 which resulted from whooping-cough, 3,457 from measles, 2,620 from scarlet fever, 1,674 from diarrhoea, 1,491 from 'fever' (including typhus, enteric fever, simple and ill-defined forms of continued fever), 902 from diphtheria, and 652 from small-pox; in all, 14,399 deaths were referred to these principal zymotic diseases, equal to an annual rate of 2·13 per 1,000, against an average rate of 2·38 in the ten preceding corresponding quarters. In the twenty-eight great towns this zymotic rate

last quarter averaged 3·13 per 1,000, and ranged from 0·82 and 0·92 in Brighton and in Derby, to 4·30 in Wolverhampton and 4·64 in Liverpool. In fifty other towns this zymotic death-rate averaged 1·95 per 1,000, while in the remaining or rural portion of the country it did not exceed 1·60.

Whooping-cough was the most fatal zymotic disease in England and Wales during the quarter ending June last. The 3,603 fatal cases of this disease were equal to an annual rate of 0·53 per 1,000, which almost corresponded with the average rate in the ten preceding June quarters. The highest rates of mortality from whooping-cough in the twenty-eight towns were 1·29 in London, 1·62 in Bolton, and 1·74 in Liverpool. Among the fifty other towns the death-rate from this disease was equal to 1·54 in Bury and 2·12 in Gateshead. The 3,457 deaths attributed to measles were equal to a rate of 0·51 per 1,000, against an average rate of 0·44 in the ten preceding corresponding quarters; the measles death-rate in the twenty-eight towns averaged 0·94 per 1,000, but the rate was equal to 2·56 in Portsmouth, 3·40 in Oldham, and 3·43 in Wolverhampton. In the fifty other large towns the highest rates of mortality from measles were 1·40 in Bury and 2·75 in Macclesfield. The 2,620 deaths from scarlet fever were equal to an annual rate of 0·39 per 1,000, which was considerably below the average rate in the corresponding quarter of the ten preceding years. In the twenty-eight large towns the highest scarlet fever rates were 1·42 in Cardiff, and 1·67 in Sheffield; among the fifty other towns the rate was equal to 1·73 in Gateshead, 1·79 in Ashton-under-Lyne, and 4·51 in Wigan. The rate of mortality from diarrhoea in England and Wales

was below the average last quarter. The death-rate from fever, which in the ten preceding June quarter had averaged 0·33 per 1,000, did not exceed 0·22 and with the single exception of the second quarter of 1881, when it was also 0·22 per 1,000, was lower than in any quarter on record. The fever death rate in the twenty-eight towns did not average more than 0·23; it was, however, 0·60 in Portsmouth, and 0·62 in Blackburn. The fatality of diphtheria somewhat exceeded the average, though it showed a marked decline from that which prevailed in the first quarter of the year. The highest death-rates from this disease among the twenty-eight towns last quarter were reported in Portsmouth and Cardiff. Of the 652 fatal cases of small-pox registered in England and Wales during last quarter, 34 occurred in Greater London (excluding 87 of London residents in hospitals situated outside Registration London), 50 in Liverpool, 20 in Sheffield, 15 in West Bromwich, 15 in Sunderland, 9 in Hull, 9 in Newcastle-upon-Tyne, and 103 in other parts of the country.

The causes of 116,661, or 91·2 per cent., of the total deaths in England and Wales last quarter were certified by registered medical practitioners; and 6,671 or 5·2 per cent., by coroners in inquest cases. The causes of the remaining 4,614, or 3·6 per cent., were not certified; this proportion showed a decline from those in recent quarters. The proportion of un-certified deaths in London was only 1·3 per cent., whereas in the rest of England and Wales it averaged 4·0. In the twenty-seven largest provincial towns the proportion of un-certified deaths averaged 3·4 per cent., and showed the largest excess in Sheffield, Hull, Halifax, and Oldham.

Analysis of the Vital and Mortal Statistics of the Twenty-eight Great Towns, dealt with in the Registrar-General's Weekly Returns, for the Second Quarter of 1884.

Towns.	Estimated Population middle of 1884.	Births.	Deaths.	Annual Rate per 1,000 Living.			Deaths from Principal Zymotic Diseases.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping-cough.	Fever.	Diarrhoea.	Rate per cent. of Uncertified Deaths.	Deaths of Children under one year of age to 1,000 Births.
				Births.	Deaths.	Principal Zymotic Diseases.										
28 Towns	3,762,354	76,334	45,433	35·0	20·8	3·1	6,842	414	2,060	903	313	2,064	506	582	2·4	137
27 Towns	4,742,993	42,520	25,489	36·0	21·6	2·8	3,255	121	1,036	560	106	768	283	381	3·4	142
London	4,029,361	33,814	19,944	33·8	19·9	3·6	3,587	293	1,024	343	207	1,296	223	201	1·3	131
Brighton	112,054	788	453	28·0	16·1	0·8	23	1	4	2	11	3	2	1·5	8	8
Portsmouth	133,059	1,155	712	34·8	21·5	4·2	140	—	85	3	17	4	20	11	0·7	119
Norwich	90,410	763	415	33·9	18·4	2·4	53	—	34	3	2	8	6	1·2	119	119
Plymouth	75,509	594	442	31·6	23·5	2·8	53	—	32	—	3	9	6	3	1·1	163
Bristol	215,457	1,741	921	32·4	17·2	1·5	78	—	5	17	3	27	12	14	2·5	115
Wolverhampton	78,367	706	487	36·2	24·9	4·3	84	1	67	6	—	—	2	7	4·3	163
Birmingham	421,258	3,824	2,181	36·4	20·8	2·8	291	8	120	30	10	71	14	38	1·5	140
Leicester	132,773	1,220	585	36·9	17·7	1·5	48	—	—	14	2	19	4	9	2·4	138
Nottingham	205,298	2,098	1,098	41·0	21·5	2·8	141	—	64	9	10	32	11	15	2·7	151
Derby	87,608	786	366	36·0	16·8	0·9	20	2	3	3	—	7	4	1	2·7	113
Birkenhead	90,870	885	423	39·1	18·7	1·6	37	—	5	12	4	4	6	6	4·7	92
Liverpool	573,202	5,094	3,146	35·7	24·8	4·6	663	50	235	28	8	249	48	45	4·8	160
Bolton	108,068	891	601	32·8	22·1	2·5	69	—	6	—	—	44	7	12	2·3	152
Manchester	338,296	3,092	2,150	36·7	25·5	2·1	242	3	53	70	3	72	9	32	2·7	162
Salford	197,151	1,774	966	36·1	19·7	2·3	112	—	12	19	3	42	14	22	4·3	149
Oldham	122,676	1,099	733	36·0	25·6	4·2	127	—	104	7	1	2	3	10	7·4	175
Blackburn	110,498	1,041	637	37·8	23·1	3·0	82	—	42	5	—	—	17	18	3·5	154
Preston	99,481	971	594	39·2	24·0	2·5	63	—	2	26	3	3	2	27	3·9	165
Huddersfield	86,004	821	407	29·0	19·0	1·9	41	—	2	1	2	26	3	7	3·4	145
Halifax	76,479	557	441	29·2	23·1	1·4	27	—	8	7	—	5	5	2	6·3	151
Bradford	209,564	1,591	1,016	30·5	19·5	1·5	77	—	32	5	2	2	15	21	3·3	162
Leeds	327,324	2,903	1,976	35·6	24·2	3·8	311	—	120	99	13	29	21	29	2·1	117
Sheffield	300,563	2,745	1,533	36·7	20·5	2·8	209	20	2	125	1	29	19	13	5·6	114
Hull	181,225	1,764	804	39·1	17·8	1·2	54	9	1	3	1	19	8	13	2·9	131
Sunderland	123,204	1,390	661	45·3	21·5	1·7	52	15	—	5	—	22	2	6	3·5	114
Newcastle-on-Tyne	151,325	1,465	767	39·3	20·3	2·3	86	9	1	29	2	26	13	6	3·5	114
Cardiff	93,468	946	524	40·6	22·5	3·1	72	4	—	33	13	11	7	4	1·7	158

ITY STATISTICS OF HEALTHY IN HEALTHY DISTRICTS OF IN.

By ERNEST HART.

ing tables have been worked out from the Registrar-General's reports. They form a statement which was made by me at a meeting of the House on Dec. 11, 1883, on the dwelling-house, in moving the resolution for the establishment of the Mansion House Committee, which is for the purpose of forming Sanitary Aid Societies in the various districts of London for the purpose of existing legislation, and for the purpose of the recommendations of the law. Up to the present time, so far as I have been able to ascertain, no statistics have, so far as I have been able to ascertain, been available for the purpose of determining the relative mortality of the various districts divided in such a manner as to show the relative mortality of the very different health conditions prevailing in rich and poor districts. These tables were printed in a tabular form, and at the meeting, and have had therefore a wide circulation. They have since been much used, and have fallen into the hands of sani-

tarians and statesmen, who have quoted them freely and appeared to consider them of some value as a ground for legislation. Mr. Gladstone and Sir Wm. Harcourt have in their places in Parliament employed some of the statistics here set out, and I find that they have been quoted at the recent conferences at the International Health Exhibition. I have, on request, furnished copies of the tables to various correspondents, who have since communicated with me, but finding that they are likely to be frequently discussed, and that their more extended publication may possibly be of some public value, I think it well to print them here. I may add that it is my intention from time to time to make a similar periodical analysis of the mortality of the healthy and unhealthy districts of London and publish the tables, and I shall be very glad to receive any suggestion from correspondents which may either further test the value of this mode of tabulation, or add to the information which they are capable of affording. The death-rates in the accompanying tables have all been corrected by the rateable distribution of deaths occurring in public institutions; without some such distribution the uncorrected death-rate of any locality is comparatively worthless.

Mortality Statistics of Healthy and Unhealthy Districts of London.

Registration Sub-Districts.	Enumerated Population, 1881.	Area in Acres.	Persons to an Acre.	Corrected Death-rate (all causes).	Zymotic Death-rate.	Deaths of Children under 1 year to 1,000 Births.
.. .. .	3,816,483	75,362	51	21.4	3.58	152
.. .. .	13,491	137	98	9.6	1.56	161
.. .. .	5,590	1,450	4	10.1	1.25	106
.. .. .	37,330	445	84	12.9	1.63	118
.. .. .	43,010	693	62	13.5	1.46	119
.. .. .	5,827	4,424	1.3	13.7	1.37	102
.. .. .	45,452	2,248	20	14.0	1.85	118
.. .. .	21,559	1,608	13	14.0	1.44	109
.. .. .	10,930	1,986	6	14.7	2.10	100
.. .. .	14,891	112	133	15.2	1.41	125
.. .. .	25,553	3,480	7	15.3	1.68	98
.. .. .	16,862	439	38	15.5	1.48	136
.. .. .	26,076	1,623	16	16.0	1.92	129
.. .. .	13,235	2,235	6	16.3	2.72	136
.. .. .	59,220	543	109	16.9	2.01	137
.. .. .	19,241	3,039	6	16.9	2.86	118
.. .. .	19,017	1,009	19	16.9	2.31	125
.. .. .	36,380	1,137	32	17.0	2.45	125
.. .. .	14,009	349	40	17.1	1.28	85
.. .. .	28,004	2,433	12	17.5	2.89	142
.. .. .	22,781	638	36	17.7	2.19	117
.. .. .	478,458	30,028	16	15.3	1.94	122
.. .. .	307,911	1,753	176	25.9	4.27	171
.. .. .	18,125	62	292	28.4	3.86	183
.. .. .	14,864	64	232	28.2	4.24	154
.. .. .	7,901	111	71	27.6	4.68	194
.. .. .	18,628	76	245	27.5	4.35	146
.. .. .	19,310	93	208	27.2	4.76	175
.. .. .	3,028	56	54	26.9	11.23	305
.. .. .	21,381	103	208	26.7	4.77	182
.. .. .	20,622	84	246	26.6	3.73	168
.. .. .	16,300	93	175	26.5	4.36	185
.. .. .	11,541	51	226	26.4	3.73	152
.. .. .	13,663	77	177	26.2	2.85	187
.. .. .	16,351	100	164	25.8	4.04	141
.. .. .	10,395	108	96	25.7	5.77	273
.. .. .	13,837	59	235	25.5	3.40	178
.. .. .	17,516	73	240	25.5	3.94	165
.. .. .	29,738	141	211	25.4	4.51	169
.. .. .	14,999	127	118	25.4	3.20	166
.. .. .	8,410	97	87	25.4	4.40	166
.. .. .	16,107	111	145	25.3	4.41	155
.. .. .	15,195	67	221	25.3	4.87	167

The average annual deaths in the unhealthy districts, 1880-1-2, were 7,968; if the healthy districts death-rate had prevailed in the unhealthy districts, the deaths would have been only 4,711, or 3,257 a year fewer than they actually were. This loss of life, according to the estimate of the minimum value of the population (men, women, and children) at 1594 a head, represents an annual money loss of the same authority there are two years disabling sickness to one death; and, on the assumption that the men aged between 15 and 45 a week and the women 9s., the annual loss from sickness in these unhealthy districts may be estimated at 71,570s., making in all an annual loss of 589,433s. caused by the excess of mortality in these twenty districts. If the whole of London, the deaths would have been annually 23,407 less than they were had the healthy districts death-rate prevailed in the whole of London, the annual loss in London is estimated at 4,236,054s. applying Dr. Farr's estimates of cost of death and sickness, the annual loss in London is estimated at 4,236,054s.

	Average Population.	Average annual Death-rate, 1880-1-2.
Peabody Buildings	11,987	18.4 or 22.8 corrected for institution deaths.
Industrial Dwellings	5,914	15.7 or 19.4
Total	17,901	17.5 or 21.6

THE SANITARY RECORD.

AUGUST 15, 1884.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

THE PROVISION OF MEDICAL ATTENDANCE IN CASE OF EPIDEMICS.

THE spread of cholera in Europe, and the possibility of its introduction into this country, has attracted attention to the means which we have available for combatting that and other epidemic diseases. Sanitary arrangements are useful for preventing the outbreak of disease, but cases may occur when persons are attacked notwithstanding every precaution, and medical assistance may become necessary. If members of the well-to-do classes are attacked, they would probably call in their own doctor, and be attended in the same way, whatever was the disease from which they suffered; and pauper patients have the same right to medical attendance if they are victims of an epidemic as when they suffer from ordinary diseases. But in case of epidemics it is specially important for the well-being of the community that medical assistance should be promptly rendered to all who may need it, and it is well to point out the means by which such assistance ought to be provided.

Under the provisions of the Public Health Act, 1875, which for this purpose is applicable to the whole of England, the Local Government Board may make regulations, amongst other things, 'for the provision of medical aid and accommodation, for promotion of cleansing, ventilation, and disinfection, and for guarding against the spread of disease.' The local authority of the district within which such regulations are in force is bound to superintend and see to their execution, and 'to appoint and pay such medical or other officers and persons, and do and provide all such acts, matters, and things as may be necessary for mitigating any such disease.' The expense of carrying this out must in the first instance be defrayed out of the rates, though in some cases the local authority may be able to recover some part of it from the individuals on whose behalf it has been incurred. In case of hospital accommodation, the Act expressly provides that expenses incurred by a local authority in maintaining a patient in a hospital shall be deemed a debt due from the patient to the local authority, and such expenses may be recovered in a court of law. The charges for medical attendance in ordinary cases can be recovered by a medical man from the person who has employed him to attend, as the law ordinarily implies a contract to pay by the person who calls him in. Such a contract may, however, in some cases be not proved, as recently a gentleman, who had called in a medical man to aid someone whom he saw suddenly taken ill in church, successfully maintained that he had made no contract to pay for the services then rendered. And

medical men may sometimes be—though we believe they rarely are—reluctant to attend cases where they think their remuneration is doubtful. If the services are rendered on the requisition of the local authority, a medical man may feel safe about getting his payment either from the patient or out of the rates, and thus it is to be hoped that there will be no delay in attending to cases of dangerous disease, through any doubt as to payment being secure. In the not improbable case of cholera or any similar disease making its appearance in a ship which enters an English port, the charges for medical attendance on board the vessel, together with any reasonable expenses for the treatment of the sick, are made payable by the captain of the vessel on behalf of the owners. These charges may be recovered summarily, so that there need be no delay in enforcing payment. A case occurred a few years ago which went ultimately to the Court of Appeal, where it was decided that a local authority may make a valid contract to pay a medical man for attending to patients during an epidemic, without observing the formalities which are required by law for the ordinary contracts of corporate bodies. A verbal order to attend, given by a duly authorised member of a local authority, is a sufficient contract to render the authority liable to pay for the medical man's services. As we have seen such services may properly be paid for out of the rates, irrespective of the question of the patient being a pauper, and the question as to who is ultimately liable to pay is one with which the medical man at the time he is called in need not concern himself. Parliament has rightly considered that in case of epidemics it is most important to have medical attendance promptly available for all who need it, and has imposed on the local authorities the liability of providing such attendance, where it may be needed, and has not imposed on them any restrictions which would delay or prevent the employment of a medical man where his services are needed.

THE Local Government Board has appointed Mr. E. G. Ballard to be an inspector, and Mr. Adrian Blakie, D.Sc., to be a sub-inspector under the Alkali, &c., Works Regulation Act, 1881.

SANITARY INSTITUTE OF GREAT BRITAIN.—At the anniversary meeting held at the Royal Institution, Albemarle Street, on Thursday, July 10, the Right Hon. Earl Fortescue in the chair, an address was delivered by Dr. H. C. Bartlett, entitled 'Some of the Present Aspects of Practical Sanitation,' and the medals and certificates were presented to the successful exhibitors at the exhibition held at Glasgow in September 1883. At the close of the address the chairman proposed a vote of thanks to Dr. Bartlett, which was seconded by R. B. Grantham, M.Inst.C.E., and a vote of thanks to the Right Hon. Earl Fortescue for presiding, was moved by Dr. A. Carpenter, and seconded by Professor de Chamouil, M.D., F.R.S.

VENTILATION OF PUBLIC BUILDINGS.—Messrs. Robert Boyle & Son, 64 Holborn Viaduct and Glasgow, have recently applied their system of ventilation to the Headquarters of the Honourable Artillery Company, Finsbury; Liberal Club, Sheffield; Burton Club, Burton-on-Trent; County Hall, Menai Bridge; Franciscan Convent, Bridgewater; New Lecture Hall, Newcastle-on-Tyne; Bromley and Beckenham Joint Hospital; New Public Baths, Lewisham; London and County Bank; St. Austell Union; Hull Workhouse, Hull; New Workhouse, Wandsworth; Richmond Union, Surrey; Hanwell Police Station; New Police Station, Mitcham; Her Majesty's Prison, Leicester; and Her Majesty's Prison, Manchester.

LONDON WATER SUPPLY.

to be deplored that the merits of the as to the London water companies, and ey supply, should be obscured by the professional antipathies and disagreeow rage around the question. Granted dity of the water is rendered infinitely it might be by the carelessness of rage in cisterns, the inquiry whether olluted Thames can be regarded as a r the potable water of some millions of ts of but one answer. Yet we are in-water companies and their professional o believe that really and truly the n volume of the water in the Thames, complaints that have been made about in the papers, do not affect in the least a beverage; and that, in point of fact, are exceptionally lucky in having so are a supply to drink.

f the possible introduction of cholera i, and the desire expressed by the medical officers of health for the recti-effects (if any) in the water supply of the and particularly for watchfulness overs and mains of the water companies, a on was recently addressed by Sir on to each of the eight companies on specially asking whether they had any port, and whether they could suggest, in heir customary precautions for ensuring their water supplies, any improvements l precautions capable of being taken resent summer. The replies received ompanies are reproduced in the last e water examiner, and will be read with ty and not a little scepticism. It was e expected that the companies would wn nests by reporting defects in the

Sir Francis Bolton ingenuously sup-ordingly, we find that with one voice heir arrangements as the most perfect be devised, and as to improvements, be impossible. The companies are ver, in their condemnation of house-all classes in not looking after their they ought. A variety of pains and e suggested as fitting punishments for o not keep their cisterns in a condition : extraordinarily pure and lavish supply rich the companies bountifully bestow. rovements, the vast filtering beds, the ply, the perennial analyses, the hydrants, of it, are set at nought by the neglect of lder to clean out his cistern with due id frequency. No doubt domestic water are very often sadly neglected, but is not d harping upon the carelessness of the a little suspicious, with our knowledge ions and neglects of the companies?

I have thought that the revelations of Department of the Local Government the fallacies of the results declared by ts ought by this time to have exploded ts based upon the largeness or small-ven bottle of water of the decimal frac-ain of some particular chemical com-en a sample of water, to which has been preciable quantity of the excreta from a ring from typhoid fever, gives, in the

hands of an eminent chemist, results which would place it in his first class of waters, those, namely, of 'extraordinary organic purity,' it is time to consider how far we are justified in relying upon laboratory inferences rather than upon the evidence of the senses. Yet Messrs. Crookes, Odling, and Tidy, who are paid by the London water companies to make to the President of the Local Government reports which he does not want, and refuses to recognise, would apparently have us believe that the Thames is still the same pellucid and silvern stream whose merits the Elizabethan poets were wont to sing.

These gentlemen report that during the first half of 1884 they examined 1,071 samples drawn from the mains of the seven companies taking their supply from the Thames and the Lea, and have been able to register these many samples as being, without a single exception, clear, bright, and efficiently filtered. Judged by the eye, they had all of them the further claim to be described as being, even when in considerable bulk, colourless. Subjected to more exact examination in this particular, their degree of brownish tint proved to be exceedingly low, so as in no case to preponderate over the proper blue tint of the water. The whole of the 1,071 samples were further examined for organic matter by the permanganate process, and for dissolved oxygen by the Schutzenberger process, with similar satisfactory results. As regards the quantities of organic carbon, and consequently of organic matter, present in the Thames-derived samples, the mean result for January, exceptionally low for this season of the year, was '118 part of organic carbon in 100,000 parts of water. The mean result for February was '140 part, for March '165 part, for April '139 part, for May '104 part, and for June '114 part of organic carbon in 100,000 parts of the water; while the highest result furnished by any single sample examined during the last two months was '129 part, equivalent to about a quarter of a grain of organic matter per gallon.

The Report of the Royal Commission on Water Supply is quoted to show that a minute proportion of organic matter, variable in amount with season, is a normal constituent of river water, and it is argued that there is no reason whatever to consider this proportion of natural organic matter as in any way prejudicial to health; and that there is absolutely no chemical evidence to indicate that the small proportion of organic matter present in the water supply of London is different, either in quantity or kind, from the natural organic matter of the river, as met with, for instance, at Lechdale, 120 miles above the intake of the companies. Still, in view of the importance which is attached, unwarrantably the reporters think, to the not inconsiderable variations in the proportion of organic matter present in the London supply, the consolatory remark is added that at periods of summer heat and drought like the present the natural agencies at work to keep down the proportion of organic matter existing in the water of the river are at their maximum of activity. 'It results in this way, that the water supply of London is at its best just at those seasons, like the present, when any failure in the quality of the supply might be considered likely to be of exceptionally serious import.' On reading this report one is tempted to repeat the inquiry, 'Can these things be?'

THE Corporation of Newcastle have agreed to erect a refuse destructor of twelve cells at Byker Hill, at an estimated cost of 7,000*l*.

REPORT OF THE METROPOLITAN BOARD OF WORKS FOR 1883.

THE work of the Metropolitan Board of Works increases every year, and, in view of the probability of an alteration in the local government of London, this report is of unusual value, as it shows the vastness of the labour that will be required from the proposed new Municipality. The Board has charge chiefly of matters affecting the metropolis as a whole, leaving those which are of a local character, such as scavenging, providing and maintaining sewers, supervising the construction of house drainage, and the general sanitation of the various parishes, to the vestries and district boards. The number of meetings of the Board and committees during the year amounted to 379, of which 104 were meetings of the whole Board, including 59 of the Works Committee and 275 of other committees; an immense labour for 46 persons to perform.

The supplementary main drainage works decided upon in 1879 consisted chiefly of storm overflows for various parts of the metropolis, so as to prevent floodings of various low-lying districts; but, judging from accounts lately received from places in the vicinity of the Lea, the scheme has not been successful so far as that part of London is concerned. The metropolitan improvements during the year are fully stated, and the relaxation granted as to the number of artisans' and labourers' dwellings, which have to be provided when old houses are pulled down, is especially referred to, as enabling the Board to carry out several long delayed improvements. Amongst these may be mentioned the new street from Tottenham Court Road to Charing Cross; the removal of the houses in unhealthy areas in Limehouse, Lambeth, St. George's in the East, Greenwich, Whitechapel, and other places. As regards several representations which the Board have received respecting blocks or groups of houses that were deemed to be unfit for human habitation, they were referred back to the vestries of the parishes from which they were sent, because the Board consider they are required to take action only when 'a complete re-arrangement of the area is required, including the opening up and widening of the streets and passages which intersect it, so as to bring in more light and air.' The cost therefore of the minor improvements necessary for providing sanitary dwellings for the poor will fall in future upon the parishes in which these small areas exist, and not upon the whole of London. This is a very important decision, especially as regards the poorer metropolitan parishes, and may have to be reconsidered.

The report refers at some length to the bridges over the Thames, nine of which are vested in the Board, three are under the control of the Corporation, and one only—viz. Westminster—was built and is maintained at the cost of the State. The question of providing additional means of communication between the north and south sides of the river below London Bridge is especially dwelt upon. The engineer to the Board brought up in 1883 a scheme for a new bridge and two tunnels, at an estimated cost of five millions sterling, which was abandoned, so far as the bridge is concerned, by the refusal of the Government to support a Bill for the extension of the coal and wine dues. The Board seem to have acted wisely in abandoning the scheme, as in 1889, when these dues will cease to be payable, the rates will be considerably increased. The chief objections

by the Treasury to continuing the duties be that the debt due by the Board would very formidable proportions by the borrow sum and of others, for other improvements appeared to 'my lords' as not sufficiently justify a continuance of a tax which adds 7 to the cost of coals. The parks, commons, spaces are also referred to, and, as they 1,769 acres, the cost of their purchase, 484, of their maintenance is by no means to be The action taken by the Board to close lators of the District Railway is stated as le the decisions arrived at by the Committees by Parliament are considered to be contrar the public has reason to expect, and by i satisfactory to the Board after the large ex they had incurred.

Under the head of gas supply we are that the limit for ammonia is now 4 grai cubic feet of gas, and of sulphur from April ber 17 grains, whilst from October to . maximum is to be 22 grains per 100 cu These limits have not been exceeded on cation by any of the companies to an ext cient to justify any adverse action being the Board. The gas is required to have ing power of sixteen candles when cons the rate of five cubic feet per hour, but the i statement is made that there is some room whether in districts on the north side of remote from any testing place, the gas is as good quality as in districts where the gas The Board has suggested, therefore, that a testing-places should be provided. The i the working of the Cattle Diseases Act are fi tioned, and it appears that 16,523 anim found in premises where the stock were with contagious diseases, and of these 2; affected with one or other of these disease were killed, 1,422 removed, and only 39 di injury that might have resulted from the u diseased meat and of the milk of the affec certainly justify the cost—nearly 3,800/.—for out this Act. The examination of the Londo milk-shops, cowsheds, and slaughter-houses actively carried on, as 26,386 visits were pa 1,121 cowsheds, 231 dairies, 1,941 milk-sh the 809 slaughter-houses that have been p the registration list. Two new slaughter-hou been licensed during the year, and 44 have b up, so that the gradual closing of the smal most unsuitable slaughter-houses is rapidly ing, the number when the Act was passe been 1,429. The Infant Life Protection Ac been a success, and its working during the not been much more satisfactory than befor chiefly arises from the difficulty of ascertain persons who are engaged in baby farm as many as 280 infants were found in unri houses. In six cases only was the Act have been infringed, and only two prosecuti instituted. There are only 37 registered h London. The details as to the supervision c and buildings, including theatres, as well as other matters, are fully set out, but the space taken up prohibits even their enumeration.

THE Corporation of Newcastle have resolved to the Local Government Board for leave to borrow to defray the cost of the proposed hospital for diseases to be erected at Heaton, according to already approved by the Council.

NOTES OF THE MONTH.

PUBLIC APPRECIATION OF INFECTIOUS HOSPITALS.

Issue of April last (see vol. v., new series, p. 498) recorded an instance of the growing appreciation of usefulness of infectious hospitals, especially with reference to the admission and treatment of children.

A gratifying proof of this is afforded by Mr. Harper who, in a recent report on the health of the rural district of Bath, observes that he has been very busy in persuading parents to send their children to the hospital. In fact, it appears to be in good repute that the small children think it a hardship to be sent home, and often cry to be taken to the hospital.

Mr. Harper speaks in high terms of praise of the kindness shown by the hospital authorities, and adds that this, together with the extension of knowledge as to the nature of infection, will tend to make the public more anxious to obtain the advantage of isolation. Even now the patients are not taken from the poorer classes, but to a certain extent from those who are able to make some contribution towards the expenses of their maintenance in the hospital. In addition to verifying, in a considerable degree, the information collected by Mr. Harper when investigating the subject, Mr. Simon's experience proves that even during the last few years a very considerable improvement has taken place in the attitude of the general public towards statutory hospitals.

INSTRUCTIONS FOR THE REARING OF INFANTS.

The object of combatting the ignorance displayed by parents in the rearing of their offspring, Mr. Cameron has suggested to the Town Council of Huddersfield that they should adopt the plan already in use in several cities at home and abroad of giving to every person registering a birth a small card containing brief directions for the management of infants. He proposes that the first handbill should contain only information about the feeding and the ventilation of their rooms, and a few brief directions for the prevention of infectious disease. On the approval of this, a separate card on the treatment of measles and whooping-cough should be prepared and distributed from each house. Dr. Cameron believes that these cards would be of essential service to numerous unintelligent but inexperienced mothers, and highly recommends the suggestion to his authorities, which is deserving of every consideration, has been tried with excellent results in various parts of the country, and there is no reason why its adoption in Huddersfield should not be successful.

OFFICIAL VIEWS AS TO CHOLERA.

In view of the further indicating the true lines of preventive action which should be followed in the case of cholera reaching these shores, Dr. Buchanan, medical officer of the Local Government Board, has prepared a preliminary report on the subject which is accompanied with extracts from reports made by himself and other medical inspectors during the years 1865-66 and 1873. In Dr. Buchanan's view, the reprints are intended to serve a double purpose. The extracts from the reports of Mr.

Simon exhibit, at greater length than in a memorandum, the doctrines concerning cholera in Europe which have been continuously held by the principal medical advisers of the English Government. Dr. Buchanan believes that they are commanding more and always more adherents among sanitary authorities on the Continent, though hitherto they have not obtained sufficient recognition in practical effort. The extracts from the reports of medical inspectors on the other hand are primarily intended for the assistance of those who may have to deal with local conditions provocative of cholera or with any outbreak of the disease in England. Both series of extracts will at the present moment be of service as indicating the true lines of preventive action against the disease which is now threatening Europe.

For public use in this country the all-important principle of cholera prevention is, that 'cholera derives all its epidemic destructiveness from filth, and specially from excremental uncleanness,' and 'the local conditions of safety are, above all, these two: (1) that by appropriate structural works all the excremental produce of the population shall be so promptly and so thoroughly removed, that the inhabited place in its air and soil shall be absolutely without faecal impurities; and (2) that the water supply of the population shall be derived from such sources and conveyed in such channels that its contamination by excrement is impossible.'

These are the words of Mr. Simon, written nearly twenty years ago and embodying the experience of nearly twenty previous years. They were written when local sanitary authorities in England had seldom begun their work; when port sanitary authorities had made no provision for dealing with imported disease; and when special orders in face of cholera were requisite in order to give such powers as those authorities have now long possessed as standing defences against all infectious diseases. It is certain that in proportion as the sanitary authorities of England have done their regular work, and exercised their ordinary powers for the protection of the public health, the country has now even less to fear from cholera than in former invasions of Europe by the disease. The extracts from reports of medical inspectors relate to certain local appearances of cholera in England during the years 1865-66. The specimen reports relate to occurrences of cholera at Theydon-Bois, in Southampton, on Irish mail steamers, at a village near Bristol, and among migrating foreigners passing through English ports. Thus they show cholera making its appearance under a variety of circumstances, and they afford some instructive instances, first of the customary, though sometimes obscure, relationship of cholera with foul water or air; secondly of the way in which the disease has been restricted to the locality of its first appearance and has rapidly become extinguished there.

ALLEGED INJURY BY VACCINATION.

THE anti-vaccinators make up in misdirected energy what they lack in numbers. Their latest attempt is an endeavour to make capital out of certain words used in the National Health Society's useful leaflet of 'Facts concerning Vaccination,' in order to make appear that the Local Government Board was stultifying itself by approving language which Dr. Cory's case traversed. Mr. George Russell, however, was able without difficulty to meet Mr. Hopwood's astute

inquiries on the subject. He pointed to the words of the pamphlet, 'that with due care in the performance of the operation no risk of any injurious effects from it need be feared,' and that such mischief as the communication of a foul disease by vaccination 'could only happen through the most gross and culpable carelessness on the part of the vaccinator.' These statements were in no way inconsistent with the report of the medical experts respecting Dr. Cory's case. The committee reported expressly that 'the infants from whom Dr. Cory took lymph for his experiments on his own arm were in such a condition of obvious syphilitic disease as would certainly have precluded their use as vaccinifers by even an inconsiderate and reckless vaccinator. Indeed, they were selected by Dr. Cory for his self-vaccination because they were unquestionable syphilitic cases.' It is a rule of practice in the profession not to use in vaccination lymph taken from a child in whom there is any suspicion whatever of syphilitic taint, or indeed in whom there is any skin disease, although of a character known to be harmless, and the observance of this professional rule is strictly enjoined by the Local Government Board in its instructions to public vaccinators throughout the country. The Board saw no reason to alter their view with regard to the pamphlet in question, which had been revised by their medical officer, and had been recommended for house-to-house distribution.

A YOUTHFUL SANITARIAN.

DR. H. C. BARTLETT, F.C.S., in his address on 'Some of the Present Aspects of Practical Sanitation,' delivered at the anniversary meeting of the Sanitary Institute of Great Britain, on July 10, refers to the written examination of May Austin, aged 13, Standard VII., who sends in a paper from the Rea Street Board School, Birmingham, shown in the School Board exhibit at the International Health Exhibition. Dr. Bartlett goes on to declare that in answer to the question 'What special points would you think of in choosing a house?' the answer was 'Dryness, light, good air, good water, and good drainage.' In delineating these 'principal points,' the descriptions are so terse and full, so complete, and leave out so little of what is essential, that unless the whole examination and teaching is the cut-and-dried result of mere *memoria technica*, nothing could be more satisfactory. If May Austin can reply on paper equally well to half a dozen more questions coming equally within the scope of our own examinations, and pass a by no means more difficult *vivâ voce*, he feels bound to admit to himself that he, as an examiner of the Sanitary Institute, must pass that very clever little girl—certainly as a sanitary inspector, and perhaps as a local surveyor.

TYPHOID FEVER IN WORCESTER.

IN his last report on the health of Worcester, Dr. Strange discusses the question how it is that, with the causes of typhoid fever so well ascertained, the disease still prevails in a town supposed to be drained and scavenged like Worcester. It is, he believes, that the draining and scavenging are imperfect. The sewers are defective, there being a frequent issue of sewer-gas from the gullies. It was to remedy this defect that eighty new ventilators were fixed a short time ago. But the chief fault

lies in the house drains and closets. Many of the house drains are badly laid, more especially in newly-erected cottages. The closets, sanitary or water, are constantly getting out of order, chiefly through the negligence of those who use them; and, if it were not that they are always placed out of doors in cottage property, the consequences would be much more serious than they now are. Moreover, water-closets of an old-fashioned construction and imperfect action are still to be found in the better class of houses, and, consequently, typhoid is as frequent in them as in the poorest cottages. The large old-fashioned privy cess-pits, some of which still remain, are also answerable for their share of typhoid. In regard to the purity of the water supply of his district, Dr. Strange observes that in so porous a soil as that of Worcester, percolation of foul matters may take place along great distances underground. The discharges from typhoid patients are often thrown into drains, or buried lightly in the soil, without efficient disinfection. These may, and doubtless do sometimes, gain entrance into the wells. And this is all the more probable because some years ago (1866), when well-water was largely used, hundreds of wells were found to be terribly polluted with sewage matter. Dr. Strange reminds his authority that a prevalence of typhoid reflects discredit upon the sanitary arrangements of the town, and he appends a list of practical suggestions, which, if carried out, would soon bring about the removal of this blot. The authority should bear in mind Mr. Simon's opinion, that 'present knowledge seems very positively to say, that the degree and extent in which enteric fever shall remain unexterminated from England will expose the degree and extent in which sanitary administration had failed in rudimentary duties.'

ISOLATION PROVISION FOR SCARLATINA.

IN commenting on the prevalence and fatality of scarlet fever in Northampton during the past year, Mr. Lee Cogan again draws the serious attention of the Town Council to the fact that, in the absence of means for hospital isolation, efforts to cope with the disease, with the object of checking its propagation, were rendered, if not positively inert, at least, comparatively speaking, ineffective. As Mr. Cogan points out, infectious hospitals afford advantages beneficial both to the sufferers and also to the community at large. The circumstances under which these patients can be treated in well conducted institutions are manifestly in every respect immeasurably more favourable for them than when treated in their own homes. The public by the removal of infected persons is preserved from the dangers of infection. The experience of almost every town possessing an infectious hospital testifies to the benefit to the public health afforded by such institutions, and Mr. Cogan anticipates that before long every town of any size throughout the country will see the absolute necessity of providing itself with a sanatorium for the disposal of its infectious sick. It is, indeed, for cases of scarlatina that, as Dr. Thorne has emphasised in his report on the subject, isolation is most constantly and most urgently needed. The mortality it occasions exceeds that of any other communicable fever prevalent in the country; it is highly infectious, and there are no effectual means apart from its isolation by which its spread can be stayed. It is to be

oped that the Town Council of Northampton, who are responsible for a population of nearly 10,000 persons, will no longer delay the erection of a suitable hospital, the more so now that the extension of cholera to this country is by no means an unlikely contingency.

THE DELANCEY FEVER HOSPITAL.

THE report recently presented on the work of the Delancey Fever Hospital during the first decade of its existence affords abundant evidence of the benefits which accrue to a district provided with properly equipped isolation accommodation. This is evinced in a striking way by the immunity which Meltenham enjoys from small-pox. Although during the past ten years the disease has gained a footing in the town on twenty separate occasions, not a solitary case has remained in the district for over forty-eight hours, nor has the disease in any instance spread beyond the family it entered. These results have undoubtedly been brought about by the prompt and energetic measures which have in each case been adopted for the isolation of the sick, for a thorough disinfection of the premises, and the inoculation of the inmates. Notwithstanding that there was a considerable prevalence of scarlet fever in some of the lower parts of the town, 59 cases having been reported during 1883, but five persons only were sent to the hospital by the Town Council, and two by the Board of Guardians. As the committee of the hospital observe, these numbers tell their own tale of cases allowed to go through the disease at home, often in crowded localities, with the absolute certainty of widening the circle of infection, and so defeating the very objects for which the institution was founded. It is to be hoped that in future years the local authorities will avail themselves more extensively of the accommodation afforded by the hospital, and this will doubtless be accelerated by the material reduction which has recently been made in the scale of charges. Dr. W. R. Smith, who appears to have bestowed much care on the working of the hospital, notes that the average age of the 8 cases of scarlet fever was 15 years, and the average length of stay a little over forty-three days. All the patients were discharged cured. During the year the erection of a small-pox laundry and wash-house was completed, and the hospital was provided with a self-acting disinfecting apparatus.

WHAT IS A DWELLING-HOUSE?

A GOOD deal of somewhat heated controversy arose in the House of Commons on May 27 with reference to a definition suggested by Sir Edward Watkin that a 'household qualification' and 'a dwelling-house qualification' should mean respectively a tenement containing not less than two habitable apartments. The honourable baronet, remarking that the dwellings conferring the franchise ought to be dwellings for Christian people, argued that the class in which fathers, mothers, and children of both sexes lived in the same room could not be regarded as capable citizens, and were unfitted, therefore, for the giving of a vote. This view was disputed by Mr. Edmondstone, who brought his Midlothian experience to bear upon the question, and Sir Charles Dilke, whose position as Chairman of the Royal Commission on the Homes of the Poor has convinced him that the misery of the one-roomed population of the country

are 'very capable citizens indeed.' To the argument of this point we shall not, of course, address ourselves; but there is one complaint made by quite a number of members in the course of the debate which has a wider significance, and that is the absence of any definition as to what constitutes a dwelling-house. The late Master of the Rolls, one of the acutest intellects the world has ever seen, in an appeal case with reference to the term 'dwelling-house,' said 'What that means nobody can say.' And he went on to observe, 'I have tried, and tried in vain, to frame an exhaustive definition which is satisfactory to my own mind.' Where so eminent a lawyer has failed, it would, of course, be presumptuous of us to offer an opinion; but may we suggest that opportunity should be taken in some way or other to settle the question which has exercised so many minds in Parliament and elsewhere. The Franchise Bill appears to afford an excellent opportunity of doing this, and it is after all in connection with the voters' register that the wrangles about the meaning of the term chiefly arise.

DIRTY TENANTS.

THE Gateshead Sanitary Authority have instructed their inspector to take vigorous action against those people who habitually keep their houses in a filthy condition, to the danger of the public health. Mr. Jones, the inspector, has accordingly summoned several persons before the magistrates, as it is beyond doubt that much of the disease in the borough is caused entirely by the filthy habits of such people. On the 13th ult. Thomas Dickson, of 4 Chapel Street, Gateshead, was charged with having his house in an indescribably filthy condition. The defendant did not appear, but his wife said that they had six children in the house, and none were healthier. The magistrates ordered the house to be thoroughly cleansed at once, and adjourned the case for a week. Their decision would depend upon how their orders were complied with. The Corporation of Newcastle, at their last meeting, acting under Sect. 90 of the Public Health Act of 1875, passed some by-laws for the better regulation of tenemented property, which will enable them to deal more effectually with dirty tenants and refractory landlords. The motion was strongly opposed, on the plea that the terms of by-laws were not publicly well known, and that they would probably be infringed unwittingly. Mr. Annan, as a matter of justice, gave notice that he would move at the next meeting that they be rescinded.

FOREIGN SANITARY EXHIBITS AT THE HEALTH EXHIBITION.

VISITORS to the Health Exhibition, if they will take the trouble to examine some of the examples shown by foreign exhibitors, will be able to make instructive comparisons between these and some of the exhibits of our own country. From a strictly sanitary point perhaps they will not be able to do so, as the foreign sections generally seem to have ignored the question of drainage on any scientific principle, and this perhaps is not to be wondered at, as any one having had much experience of foreign hotels and houses must have come to the conclusion that both science and principle are entirely wanting. In the Belgian Section they will see that the sanitary arrangements

of some of their large schools are more or less illustrated, but that, however, on lines which we should scarcely care to follow. A few efforts are also shown as regards housing the poor, although on a small scale, but one example on the building society principle goes carefully into the cost, and gives the results, which certainly seem to be very satisfactory, and might be in certain circumstances developed more fully in this country, where the want of organisation is a great hindrance to the movement. In the French Section, however, some attempts at sanitation may be noticed; an apparatus for disinfecting clothing and bedding by means of hot air and fumigation is illustrated, and several hygienic works and brochures are given; but these we are afraid are special cases, and the majority of Frenchmen have not yet awakened to the broad principles which are rapidly becoming so general here and in America. Some instances of housing the poor, also on a small scale, are shown, but the illustrations scarcely lead us to suppose that the sanitary requirements are met in the way that we are accustomed to.

SLAUGHTER-HOUSE REFORM.

A LITTLE tract with the above title reaches us from Coventry. Some particulars relating to the Public Abattoir movement having been supplied to the 'Coventry Society for the Prevention of Cruelty to Animals,' the committee thought it advisable to lay the information before the public, together with some extracts from the reports of various societies, in the hope that it might help forward the provision of improved accommodation for slaughtering in Coventry. We heartily wish the compilers of the pamphlet all success. Coventry, like so many other important towns, has no public slaughter-house, and the slaughtering is done in fifty-three private slaughter-houses, the condition of many of which is far from satisfactory from a sanitary point of view, many of them being 'small, situate in the midst of crowded localities, approachable up entries and passages, in close proximity to dwelling-houses, and in one or two cases are to the front of the street, where the public may witness the slaughtering.' We are pleased to see that organisations for the repression of cruelty to animals are taking this matter up. Those who desire the efficient inspection of all carcases intended for the food of man, and that killing shall be done under wholesome conditions, will find useful allies in those who are working for the prevention of cruelty. The general provision of public slaughter-houses, and requiring that all killing and dressing be done therein, is the only way to prevent cruelty, no less than the only way to stop the trade in diseased meat.

EMIGRATION

By the issue of the emigration return for the month of June we are enabled to summarise the returns for the first six months of this year. It appears that during this period there has been a very marked decline in emigration from the United Kingdom. During the first half of 1884 the total number of emigrants from the various ports where emigration officers are stationed was 165,594, of which 129,129 were of British origin (including 71,088 English, 12,040 Scotch, and 46,001 Irish), 35,116 foreigners, and 1,049 whose nationality was not distinguished. Compared with the corresponding period of the

preceding year 1883, the number of emigrants for each division of the United Kingdom, as well as the number of foreigners, showed a decrease, the largest proportional decline being in the Irish emigrants. In British emigration the decline amounted to 20 per cent. among the English, 27 among the Scotch, and no less than 38 among the Irish. The numbers of British emigrants, which during the first six months of the three years 1881-83, were 115,793, 148,730, and 178,955 respectively, declined, as before stated, during the first half of this year to 129,129, or as much as 28 per cent. Of these 129,129 emigrants of British origin, 82,276 sailed for the United States, 19,476 for British North America, 22,799 for Australia, and 4,578 for all other places. Compared with the corresponding period of 1883 the emigration to the United States declined 27 per cent.; to British North America, 30 per cent.; to Australia, 25 per cent.; and to all other places 25 per cent. With reference to the proportion of the population of the three divisions of the United Kingdom who emigrated during the first six months of the current year, it may be noted that of each million of their estimated populations 2,657 English, 3,138 Scotch, and 9,296 Irish, emigrated. These proportions showed a marked decline from those recorded in the corresponding period of 1883, when they were 3,340, 4,358, and 14,326 respectively.

SANITARY ARRANGEMENTS IN THE CITY.

At a recent meeting of the City Commissioners of Sewers it was moved, 'that in all instances where new houses were being erected the Commissioners of Sewers should place themselves in communication with the building or other owner, and treat with him or them for the construction of a proper ventilating shaft in the chimney-breasts or party or other walls for the purpose of ventilating the sewers, carrying the ventilating shafts well above all adjoining roofs. At first sight this may appear to be a rather startling suggestion, to bring the foul gases from the sewer through the house. At present the sewers under the public roads are ventilated by a number of iron gratings placed in the centre of the roads and communicating by means of brick shafts with the sewers, these gratings serving both as inlets of fresh air and outlets for the foul air. But it must certainly strike anyone that the idea of discharging the gases at the level of the roadway is rather a primitive one, and not in keeping with the advanced views in other directions, and it would undoubtedly be a great improvement to disperse the foul air above the roofs of the houses. If every house in a road were provided with a 4-inch ventilating pipe attached to the branch drain leading from the sewer, the gratings in the roadway would then become inlets of fresh air, and the discharge of foul air being so thoroughly subdivided, and also effected above the houses, the arrangement would then become as safe as could be well imagined. The ordinary suggestion is that the ventilating pipes should be carried up *outside* the houses. The advantage of placing the pipes *inside* is that they would thus be kept warmer and the up-draught be stronger. It would be objected at once that in case of a single joint of this pipe becoming defective the house would be poisoned by gas from a great length of sewer, but in new houses this danger might be averted by placing the pipe in a carefully and specially arranged flue, so that any escape of gas

ould be confined to the flue, and would find its exit in the ordinary way. If we mistake not, this system has to a limited extent been carried out at Gloucester, under the direction of the city surveyor, but in London especially there would be many difficulties in construction and other points, which must for some time to come prevent its adoption from becoming general, how desirable soever it may be.

HOW TO PREVENT AND OPPOSE THE CHOLERA.

THE National Health Society have issued a circular letter to sanitary authorities, stating that in view of the spread of cholera in France, and of the possibility that the disease may be imported into this country, it appears to be very important that householders generally should understand the precautions which they must individually adopt if the progress of the disease—when it has once gained a footing here—is to be checked. In these circumstances the society has prepared a memorandum, couched in plain and simple language, explaining 'How to Prevent and Oppose the Cholera.' The society suggests that this pamphlet might very usefully be distributed from house to house in each district by the officers of the sanitary staff. With the object of encouraging as far as possible the taking of precautions against the invasion of cholera the society are prepared to supply copies at the cost of printing—viz., 1*l.* 1*s.* per 1,000, and will on request give instructions for the filling in of certain blanks on the last page, with the names of the local medical officer of health and inspector of nuisances, without further charge, provided that no less than 5,000 copies are ordered. The memorandum contains a variety of useful instructions as to the precautions to be observed to keep the cholera away, and to prevent its spread if it should come. Its universal distribution throughout the country would therefore be a great advantage, and it is to be hoped that local authorities may see fit to incur the small expense which the purchase of a few thousand copies would entail. It should be added in this connection that the pamphlet, being a copyright publication, cannot be reprinted without the assent of the society.

VACCINATION *v.* VACILLATION.

THE Guardians of Dewsbury appear to be sincerely desirous of emulating the doughty deeds of the Keighley guardians of happy memory, and of spending a period of seclusion at York Castle in the sacred cause of anti-vaccination, to be welcomed back at its termination with banners and bands of music. It is perfectly idle for the guardians to pretend that they are anxious to carry out the vaccination laws under proper safeguards. Their whole action shows them to be possessed with the demon of incurable wrong-headedness. They have trifled with the law and the Local Government Board long enough. With their specious pleas of lack of proper candidates, and of desire that the vaccinator shall give a guarantee against ill-effects arising from vaccination, they have frittered away something like twelve months of time, during which the district has remained unprotected from small-pox. It is to be hoped that the guardians will now recognise that, whether they like it or not, the law is more powerful than they, and that if they do not do as the law tells them, what Mr. Baron

Huddleston delicately styles 'very serious consequences' will follow for themselves.

POISONED BY CANNED TOMATOES.—DANGER OF USING A CHLORIDE OF ZINC FLUX.

AN interesting case, in which a whole family were poisoned (fortunately not fatally) by eating canned tomatoes, is reported by Dr. J. G. Johnson, of Brooklyn. A lady, her son and nephew, and three daughters, partook of bread and butter and boiled tomatoes for lunch. About two hours after they were all taken ill with burning pain in the pit of the stomach, intense thirst, dryness of the throat, retching and tenesmus. On the symptoms increasing the mother administered a purge, and the boys, after some hours, were able to throw off the contents of their stomachs, and improved. The mother and daughters grew worse, and by the fourth day the eldest daughter had all the symptoms of severe gastro-enteritis, the abdomen being intensely tender, and she was beginning to sink into a state of coma. The mother and second daughter suffered in the same way, the latter having, in addition, a fiery red eruption from head to foot, accompanied with intolerable itching. The eldest daughter passed into a state of profound coma, from which she could not be aroused, and on the evening of the eighth day she was seized with epileptiform convulsions, which continued with considerable severity till the tenth day, when the bowels began to act, and the patient improved. By this time the other patients were also convalescent. That they were suffering from some irritant poison was evident from the fact that they all sat down to lunch in health, and that all who partook of the lunch were affected. That the poisoning was not caused by the bread and butter was proved by the lady's husband having eaten of it for breakfast and supper with impunity. Dr. Johnson concluded the symptoms were not those which might be expected from the ingestion of over-ripe or spoiled tomatoes, and that if there had been a ferment or poisonous mould present it would have been rendered innocuous, as the tomatoes had been well boiled just before being eaten. Could the vessel used in cooking have introduced a mineral poison? No; the vessel was made of fire-clay with a salt glaze, and had been in use by the family for over a month. The spoon used in stirring was also carefully examined—it was triple plated and unworn. The poison must have been a soluble one, and contained in the tomato juice, for the eldest daughter (who suffered most severely) had not eaten of the solid part, but soaked bread in the juice. Unfortunately the dishes had been washed, and none of the fruit or juice remained for analysis. The symptoms corresponded closely with those of verdigris poisoning, and Dr. Johnson was at first inclined to attribute them to this, as in canning establishments large copper kettles are used, and verdigris frequently forms in them when acid fruits are stewed and allowed to stand. However, on showing a can similar to that used for the tomatoes to a tinsmith a flood of light was thrown upon the case. This man pointed out to Dr. Johnson that the cap was not fastened to the head of the can by a resin amalgam, as the sides were, but that the amalgam was made of muriate of zinc—i.e. pieces of zinc were placed in muriatic acid and dissolved till the acid would no longer attack the zinc, and this liquid was painted into the groove at the head of the can. The cap

was then placed on and held with a clamp, and the soldering iron passed round. Of course the solder held the acid in, and if there happened to be too much acid applied to the groove, then, as the tin expanded with the heat, it would be forced into the can. This appeared to Dr. Johnson to offer a reasonable solution to the problem he had set himself to master—the source and nature of the poison in canned tomatoes, the ingestion of which had so nearly proved fatal. That chloride of zinc was the poisonous agent in these cans is not absolutely proved, but so nearly that Dr. Johnson is more than justified in warning the profession and the public against this new danger, and cautioning purchasers to 'reject every article of canned food that does not show the line of resin around the edge of the solder of the cap, the same as is seen on the seams at the side of the can.'

LAMB AT THREEPENCE A POUND.

A MAN named Clark, living at Turnham Green, was lately prosecuted by the Fulham Board of Works for exposing for sale in King Street West, Hammersmith, the carcase of a lamb unfit for food of man. Dr. Collier, the medical officer of health for the district, stated that on the evening of the 21st. ult. his attention was drawn to the defendant's stall by a man calling out 'Lamb, 3d. a pound.' He went up to the stall and noticed a carcase of lamb, the flesh of which was spotted. He was of opinion that the animal had died of fever, and the meat had been brought before a magistrate and an order to destroy it obtained. Mr. Kisch, who appeared for the defendant, said the meat was Australian, and was so late in the market, through delays in transit, that the defendant had been able to purchase it at an exceptionally cheap rate. It was passed by the port sanitary authority and by the chief inspector of the meat market. Mr. William Wild, Chief inspector of the market, was called, and confirmed Mr. Kisch's statement. The defendant was fined 10s. and 3s. 5s. costs; the magistrate remarking that if it had appeared to him that the defendant knew the meat was bad he would have sent him to prison.

This case affords a good illustration of the unsatisfactory way in which meat is inspected. All meat intended for food of man should be subjected to a careful examination to ascertain if it be sound and free from disease, and the examiner should possess the necessary skill and knowledge. One inspection is sufficient provided it be thorough. As matters are, however, it would appear that meat may run the gauntlet of two inspections and yet be so bad as to be pronounced unsound directly it is seen by a medical officer of health. We are pleased to notice that the inspection of meat markets was one of the special subjects discussed at the Public Medicine Section of the Belfast meeting of the British Medical Association. Few topics are more deserving of attention.

MISS FLORENCE NIGHTINGALE ON THE CHOLERA.

In a letter appearing in the *New York Herald* Miss Florence Nightingale gives the following practical advice concerning the cholera:—That our whole experience in India, where cholera is never wholly absent, tends to prove—nay, actually does prove—

that cholera is not communicable from person to person. That the disease cannot be ascribed to 'somebody else'; that is, that the sick do not manufacture a 'special poison' which causes the disease. That cholera is a local disease—an epidemic affecting localities, and there depending upon pollution of earth, air, and water and buildings. That the isolation of the sick cannot stop the disease, nor quarantine, nor cordons, nor the like. These, indeed, may tend fatally to aggravate the disease, directly and indirectly, by turning away our attention from the only measures which can stop it. That the only preventive is to put the earth, air, and water and buildings into a healthy state by scavenging, lime-washing, and every kind of sanitary work, and, if cholera does come, to move the people from the places where the disease has broken out and then to cleanse. Persons about cholera patients do not 'catch' the disease from the sick any more than cases of poisoning 'infect' others. If a number of persons have been poisoned, say by arsenic put by mistake into food, it is because they have each swallowed the arsenic. It is not because they have taken 'it,' the 'mysterious influence,' of one another.

In looking sadly at Egypt—Egypt, where cholera did not begin anywhere along the route from India to Europe, but at Damietta, where no ship and no passenger ever stops, and where the dreadful insanitary condition of the place fully accounts for any outbreak of cholera—in sorrowfully looking at Egypt and at Europe now, one might almost say that it is this doctrine of a special poison emanating from the sick and which it is thought can be carried in a package that has (mentally) 'poisoned' us. People will soon believe that you can take cholera by taking a railway ticket. They speak as if the only reason against enforcing quarantine were, not that it is an impossibility and an absurdity to stop disease in this way, but that it is impossible to enforce quarantine. 'If only we could,' they say, 'all would be well.' Vigorously enforce sanitary measures, but with judgment—e.g. scavenge, scavenge, scavenge; wash, cleanse, and limewash; remove all putrid human refuse from privies and cesspits, and cesspools and dustbins; look to stables and cowsheds and pigsties; look to common lodging-houses and crowded places, dirty houses and yards. 'Set your house in order' in all ways sanitary and hygienic according to the conditions of the place, and 'all will be well.' The real danger to be feared is in blaming somebody else and not our own selves for such an epidemic visitation. As a matter of fact, if the disease attacks ourselves we ourselves are already liable to it. To trust for protection to stopping intercourse would be just as rational as to try to sweep back an incoming flood instead of getting out of its way.

MR. CHARLES WINGATE, of New York, points out in the *Medico-Legal Journal*, published in that city, that sanitary legislation in England dates from a very early period. For instance, Edward II. decreed that a butcher who sold measles pork should be fined for the first offence, pilloried for the second, imprisoned and fined for the third, and expelled the town for the fourth. Richard II. took measures against the pollution of rivers. Henry VII. prohibited cattle-slaying within walled towns with three exceptions. Elizabeth enacted that only one family might dwell in a cottage. The plague, in the time of Charles II., led to many health enactments. More than two centuries ago we read that Shakespeare's father was repeatedly fined by the authorities of Stratford-on-Avon for throwing garbage into the streets in front of his cottage.

THE PUBLIC HEALTH DURING JULY 1884.

THE mean temperature during the month of July at the Royal Observatory, Greenwich, was $63^{\circ}4$; it exceeded by 0.8 the average July temperature in one hundred years, and was as much as $3^{\circ}6$ above that recorded in the corresponding month of 1883. An excess of temperature prevailed on fifteen days of the month, while on the other sixteen days it was below the average. The warmest day of the month was the 4th, when the mean was $72^{\circ}4$, and showed an excess of no less than $11^{\circ}0$; the coolest day was the 26th, when the mean was only $54^{\circ}2$, and $8^{\circ}5$ below the average. Rain was measured at Greenwich on sixteen days during the month, to the aggregate amount of 8 inches, which was 0.8 of an inch below the average July rainfall in sixty-one years. During the first seven months of this year the rainfall amounted to 10.7 inches, which was nearly three inches below the average rainfall in the same period of sixty-one years. The sun was above the horizon during 496.8 hours in July, but only 126.5 hours of bright sunshine were recorded at Greenwich; this amount was considerably below that registered in the corresponding period of any year since 1879. Southerly winds prevailed almost throughout the month.

In the twenty-eight large English towns dealt with by the Registrar-General in his Weekly Returns, which have an estimated population of nearly eight millions and three-quarters, 28,589 births and 19,121 deaths were registered during the five weeks ending the 4th inst. The birth-rate, which had been 35.5 and 46 in the two preceding months, further declined to 40 during July, and almost corresponded with the rates recorded in the same month of the two preceding years, 1882-83. In these twenty-eight towns the lowest birth-rates last month were 28.1 in Bradford, 28.2 in Brighton, and 29.2 in Huddersfield and in Halifax; in the other towns the rates ranged upwards to 40.8 in Nottingham, 42.1 in Cardiff, and 42.4 in Sunderland. The birth-rate last month in London was 32.9, while it averaged 35.1 in the twenty-seven provincial towns.

The annual death-rate in the twenty-eight towns, which in the two preceding months had been 20.7 and 19.3, rose to 22.8 during July, principally owing to the greatly increased fatality of diarrhoeal diseases. This rate considerably exceeded those recorded in the corresponding months of 1882 and 1883, which were 19.1 and 20.7 per 1,000 respectively. The lowest rate of mortality last month in these towns was 14.5 in Bristol. The rates in the other towns, ranged in order from the lowest, were as follows:—Brighton, 14.6; Portsmouth, 15.8; Huddersfield, 17.5; Derby, 18.1; Plymouth, 18.2; Hull, 18.4; Birkenhead, 18.6; Birmingham, 19.1; Bradford, 19.3; Oldham, 20.5; Blackburn, 20.8; Wolverhampton, 20.9; Salford, 21.4; Norwich, 21.4; Halifax, 21.6; Sunderland, 22.4; Bolton, 22.7; Cardiff, 23.1; London, 23.7; Newcastle-upon-Tyne, 23.9; Sheffield, 24.0; Leeds, 24.5; Manchester, 25.0; Nottingham, 25.6; Liverpool, 26.7; Preston, 26.8; and the highest rate during the month, 27.3 in Leicester. While the death-rate in London during July, as above stated, was as much as 23.7 per 1,000, it did not average more than 22.0 in the twenty-seven provincial towns. The 19,121 deaths from all causes in the twenty-eight towns during the five weeks of July included 4,986 which were referred to the principal zymotic diseases, of which 3,012 resulted from diarrhoeal diseases, 540 from measles, 529 from whooping-cough, 66 from scarlet fever, 214 from 'fever' (principally enteric), 132 from small-pox, and 123 from diphtheria. These 4,986 deaths were equal to 26 per cent. of the total deaths, and to an annual rate of 5.94 per 1,000. This zymotic rate, owing to the prevalence of summer diarrhoea, considerably exceeded that recorded in recent months, and also was above the rate from the same diseases in the corresponding months of either of the two preceding years. The zymotic death-rate in London during July was

as much as 7.03 per 1,000 (of which 4.52 was due to diarrhoea), whereas it did not exceed 5.01 in the provincial towns, among which the diarrhoea rate was 2.95 per 1,000. The zymotic rates in the provincial towns ranged from 1.1 and 1.8 in Huddersfield and Bristol, to 7.5 in Liverpool, 7.8 in Nottingham, 9.0 in Preston, and 10.4 in Leicester.

Diarrhoea was by far the most fatal zymotic disease in the twenty-eight towns during July. The rate of mortality from this disease in these towns, which had been but 0.37 in June, rose to 3.67 during July, and exceeded that recorded in the corresponding month of 1883, when it did not exceed 2.40 per 1,000. The diarrhoea death-rate last month did not exceed 0.49 in Huddersfield, 1.07 in Wolverhampton, and 1.09 in Halifax; while it ranged upwards in the other towns to 4.53 in Leeds, 6.00 in Nottingham, 7.34 in Preston, and 8.80 in Leicester. While the rate of mortality from diarrhoea was 4.52 in London, it did not average more than 2.95 in the twenty-seven provincial towns. The death-rate from measles, which had been 0.94 and 0.92 per 1,000 in the two preceding months, further declined during July to 0.64. In London the rate from this disease was 0.60, and the highest rates among the provincial towns were 1.98 in Liverpool, and 2.08 in Blackburn. The rate of mortality from whooping-cough was 0.63 per 1,000, and showed a further decline from the rates in recent months, although it considerably exceeded the rate recorded in the corresponding period of last year. In London the rate from this disease was 0.73 per 1,000, and among the provincial towns the highest whooping-cough rates were 1.02 in Leicester, 1.11 in Liverpool, and 2.37 in Sunderland. The death-rate from scarlet fever, which in the eight preceding months had steadily declined from 0.84 to 0.35 per 1,000, rose again during July to 0.44. In London the rate of mortality from scarlet fever was equal to 0.38 per 1,000, while in the twenty-seven provincial towns it averaged 0.48, and showed the highest proportional fatality in Wolverhampton, Sheffield, and Cardiff. The death-rate from 'fever' (principally enteric or typhoid) showed a slight increase upon recent monthly rates, and was considerably higher in London than in the aggregate of the provincial towns. The rate of mortality from diphtheria corresponded with the rate in the preceding month; this disease showed some prevalence in London, but very few fatal cases were recorded in the provincial towns. During the five weeks of July 132 fatal cases of small-pox were registered in the twenty-eight towns, showing a marked decline from the number during June; of these, 102 were returned in London, 13 in Liverpool, 6 in Sheffield, 5 in Hull, 5 in Sunderland, and 1 in Cardiff. Judged by the returns of the Metropolitan Asylum Hospitals, the prevalence of small-pox in London showed a further considerable decline throughout July. The number of small-pox patients under treatment in these hospitals, which in the nine previous months had steadily increased from 41 to 1,290, declined to 892 at the end of July. The average weekly number of new patients admitted to these hospitals, which had risen from 18 to 275 in the six previous months, fell during July to 151.

The rate of infant mortality in the twenty-eight towns, measured by the proportion of deaths under one year of age to births registered, was equal to 246 per 1,000 during July, against 163 and 195 in the corresponding periods of the two preceding years, 1882-83. This increase was entirely due to the excessive fatality of summer diarrhoea, which caused very high rates of infant mortality in many of the towns. While the infant mortality did not exceed 131 per 1,000 in Brighton and Bristol, where but little diarrhoea existed, it was equal to 303 in Nottingham, 326 in Preston, and 453 in Leicester, where the highest death-rates from diarrhoea were recorded.

The death-rate from diseases of the respiratory organs, judged by the metropolitan returns, differed but slightly from the average during July. The weekly number of deaths referred to these diseases in London averaged

194, and the annual death-rate was equal to 2.52 per 1,000. In Liverpool the annual rate of mortality from these diseases was last month equal to 3.80 per 1,000.

The causes of 390 of the 19,121 deaths registered in the twenty-eight towns during the five weeks of July were not certified, either by medical practitioners or by coroners. These uncertified deaths were equal to 2.04 per cent. of the total deaths, which was below the average in recent months. In London the proportion of uncertified deaths did not exceed 1.07 per cent., while it averaged 2.92 in the twenty-seven provincial towns; and ranged from 0.00 and 0.76 in Portsmouth and Plymouth, to 5.00 in Hull, 5.81 in Oldham, and 7.41 in Birkenhead.

Among the population living in the outer ring of suburban districts around London, estimated at rather more than a million persons, the annual death-rate during July from all causes was equal to 18.9 per 1,000, against 14.6 and 16.7 in the corresponding periods of 1882 and 1883. During the five weeks ending the 2nd instant, 313 fatal cases of diarrhoea, 69 of whooping-cough, 29 of measles, 24 of small-pox, 22 of diphtheria, 19 of 'fever,' and 12 of scarlet fever were recorded in the outer ring. These 488 deaths were equal to an annual rate of 4.74 per 1,000, which considerably exceeded the rate recorded in the same month of the two previous years. The fatality of measles and scarlet fever showed a decline, but that of each of the other zymotic diseases showed an increase. The 24 deaths from small-pox registered in the outer ring included 15 in West Ham, 3 in Croydon, and 2 in Hornsey. Six fatal cases of diphtheria occurred in Tottenham sub-district, and 6 of measles in the sub-district of Bromley.

THE use of tube or Abyssinian wells for obtaining water in rural districts has often been resorted to, and almost invariably with success. This plan, which possesses many obvious advantages over the ordinary open well, has been tried with excellent results at Watford. In referring to the subject in a recent report, Dr. Saunders suggests that the sanitary authority should obtain the necessary tackle and lend it to persons whose means are small. At this time of the year, when the usual supplies of water in many districts are getting scanty, the suggestion is well worthy of a trial.

M. HYADES has written a memoir on the hygiene of the Fuegians which he studied during his visit to Terra del Fuego. His memoir contains also considerable information on affections peculiar to the Fuegians. It might have been reasonably expected that the hygiene of the Fuegians would have been open to the celebrated description by the schoolboy of the habits and manners of the Romans!

THE Sanitary Authorities of St. Pancras have resorted to a special organisation of their staff to make a house-to-house call weekly, not only for the purpose of looking after the water-supply and drainage, but to see that the dustbins are clear of animal and vegetable refuse. A number of men are employed in following the carts, supplied with carbolic acid, and as soon as the bins are cleared commence their work of disinfecting. It is a most remarkable fact that four-fifths of the inhabitants exhibit annoyance at the weekly visits, and in the majority of cases will not allow the dustbins to be emptied until they are overflowing with refuse. This circumstance, however, only puts in a stronger light the urgent necessity, especially during hot weather, of removing all the multifarious decomposing matter of which the so-called dustbin is the receptacle in all neighbourhoods, rich as well as poor. The Vestry of St. Pancras have shown practical common sense in the step which they have taken, which should be imitated by every parish. Very forcible and stringent measures are required to prevent many of the inhabitants of this vast metropolis from becoming piggishly indifferent to dirt and bad smells.

NOTIFICATION OF INFECTIOUS DISEASE.

THE question of the compulsory notification of infectious disease, and especially of the person by whom such notification is to be made, appears to have now taken firm root as one of the most pressing sanitary problems of the day. It was hardly to be expected, perhaps, that there should be absolute unanimity with regard to it on the part of the medical profession; but one was scarcely prepared for the complete opposition of opinion which has been revealed by recent discussions at the International Health Exhibition and elsewhere. We publish to-day two admirable papers on the subject by two acknowledged leaders of the sanitary world. The one argues strongly in favour of notification by the medical man; the other argues just as strongly in opposition to it. The one treats as of no importance objections which seem to the other to be of paramount weight. If we could print the opinions of these two authorities in parallel columns, such of our readers as do not possess an abnormal development of the critical faculty might well stand aghast, and wonder how with views so divergent as these, there could be any hope of the system of compulsory notification making progress at all. The answer is to be found in the words of Goethe: 'More light': and it is with the view of shedding more refulgence upon the question that we inaugurate the system of returns to which we refer more at length below. After all, a system of whatever kind must be judged by its results; and the outward and visible sign of those results is, in the case before us, a diminution of the prevalence of fatality of zymotic disease. We have before pointed to the futility of merely collecting together for dry statistical purposes a record of the zymotic sickness in this or that district. The notification return, though useful of course for reference and table-making, should be regarded primarily as a danger signal, upon which the local authorities, if they are wise, will lose no time in acting.

There are reasons for belief that before very long a general inquiry into notification and its results, actual and proposed, will be undertaken by the Government. Such an inquiry has been recommended by the Special Committee which was appointed this session to deal with the various Corporation Bills containing sanitary clauses, and it is apparently coming to be generally recognised that the present haphazard method of dealing with the matter can be endured no longer. Meanwhile, we think it useful and instructive to place upon record each month the numerical results of disease-notification, as obligingly furnished to us by the various medical officers of health. Later on it may be possible, from a study of the returns and of the Registrar General's figures about towns not included in the tables, to form some sort of statistical judgment as to the propriety of extending the system of compulsory notification throughout the country. At present the materials for such a judgment do not exist; and it is especially with the object of helping towards a calm and impartial consideration of the question that our returns of infectious sickness have been organised.

The following table contains uniform statistics for sickness and mortality in twenty-eight of the thirty-eight urban sanitary districts in England and Scotland in which the notification of infectious disease is compulsory. We hasten to take this opportunity gratefully to acknowledge the very general response of the medical officers of health whose co-operation we invited in this matter. We are pleased to be able to state that the health officers of a very large majority of the thirty-eight towns in which notification is compulsory have most readily responded to our appeal, and we are glad to be enabled to publish our first monthly table so nearly complete. We have every reason to hope that the number of contributors will increase. We would specially thank the medical officers of health for the prompt dispatch of their cards. While we are fully aware of the difficulty which is often experienced in furnishing the required information immediately after the close of the

[illegible]

month, we venture to hope that, whenever practicable, the cards may be posted during the first four days of the month, as the table is prepared under pressure, which can be greatly lessened by the early transmission of the cards. In one respect, and one only, the uniformity of our statistics is not quite so complete as we could wish it to be. A large proportion of the facts are no doubt compiled from weekly returns. In these cases the monthly return will sometimes embrace four, and occasionally five, weekly returns. In order to secure uniformity, it may be useful to remember that a week should invariably be included in that month to which the greater number of its days belong. For instance, if the monthly totals are made up from weekly returns, those for the month of July now under review should consist of five weeks ending the 2nd instant; and the return for our next issue should relate to the four weeks ending August 30. Returns for calendar months are, however, much preferable whenever it is possible to obtain them.

The estimated population of the twenty-eight towns, for which we are enabled to publish complete statistics for the month of July last in the accompanying table, is nearly two and a half millions. The annual death-rate from all causes during that period in these twenty-eight towns averaged 19.53 per 1,000 persons estimated to be living therein. The death-rates were considerably below the average in Barrow-in-Furness, Burton-upon-Trent, and Reading; while they showed an excess in Halifax, Jarrow, Bolton, Warrington, Preston, Nottingham, and Leicester. Most of these higher rates of mortality were in great measure due to the excessive prevalence of diarrhoeal diseases. The death-rate from the eight infectious diseases dealt with in the table, concerning which notification is compulsory, averaged 0.57 per 1,000 in the twenty-eight towns furnishing this information. No death from any of these diseases occurred in Burton-upon-Trent; in the other towns the rates ranged from 0.15 in Derby, 0.16 in Dundee, and 0.25 in Bradford, to 1.07 in Preston, 1.14 in Lancaster, and 1.74 in Burnley. Turning to the notified cases of infectious disease in these twenty-eight towns, we find that the average proportion to the population of persons reported to be suffering from one or other of the eight diseases enumerated in the table was 3.86 per 1,000. No death was notified from any of these diseases in Rotherham during last month; in the other towns the proportions of notified cases ranged from 0.55 in Macclesfield, 1.39 in Accrington, and 1.90 in Burton-upon-Trent, to 5.28 in Bolton, 5.53 in Burnley, 5.81 in Derby, and 10.06 in Salford. Turning to the several diseases, we find that scarlet fever showed the greatest proportional prevalence in Bolton, Burnley, Derby, and Salford; enteric fever in Preston, Edinburgh, Jarrow, and Barrow-in-Furness; typhus in Aberdeen and Birkenhead; and diphtheria in Salford and Nottingham. Cases of small-pox were only notified in four of the twenty-eight towns—Aberdeen, Birkenhead, Bolton, and Salford. The total deaths in these twenty-eight towns from the eight diseases were 128, and the notified cases 862; it would appear, therefore, that, if all the cases were properly notified, the mortality must have been nearly 15 per cent. of those attacked. The mortality among the scarlet fever cases, according to the totals, appears to have been equal to nearly 15 per cent., and among enteric fever cases to as much as 27 per cent. The general mortality from scarlet fever and enteric fever, judged by hospital statistics, may be said to be about 10 and 20 per cent., respectively, of persons attacked. The percentages in the twenty-eight towns last month show, therefore, a considerable excess, and are probably overstated from a certain proportion of the cases escaping notification, while every death is necessarily reported.

It was stated at the last monthly meeting of the Blaydon Local Board that much mortality was occasioned at Blackhill Mill through deficiency of the quantity and quality of the water supply.

SPECIAL REPORTS.

THE PARKES MUSEUM.

At the annual meeting held on July 9 (Captain Galton in the chair) a letter was read from the Westminster regretting his inability to attend the and a report was read by the chairman of it showing the valuable work that had been carried on the museum during the past year. Twenty-one have been arranged by the Council, and the museum by some of the best authorities in and sanitary science. These lectures have much valuable information, and have dealt with of the subjects included in the scope of the museum in a most useful and interesting manner. The has been largely used by lecturers on public and other skilled teachers for practical demonstration to various classes of students, &c., who for this have been admitted to the museum without entrance fee. In this way the special advantages offered by the museum have been utilised for the purpose of instructing a large number of students and others, who by the use of their several callings may be expected in the future to exercise an important influence in the promotion of health in connection with the construction of houses and otherwise; and the Council are glad to see the facilities thus offered have been fully appreciated by teachers and students having expressed a desire for further opportunities of the same sort might be afforded. The members numbered 99 on June 30, 1883, just opening of the museum; they now number 260. In the year the museum has been visited by 6,870 persons. The lamented president, His Royal Highness Leopold, Duke of Albany, in his inaugural address on May 26, 1883, said that the sole object of the museum was 'to disseminate and to help others in disseminating the laws of health.' The sphere of work thus foreseen by the late Duke of Albany has (as will be evident to those who peruse this report) become an accomplished fact in every particular. The utility of the museum has increased month by month. The museum has met a great public want; and the Council would strongly urge upon the members and upon all interested in sanitation to use their personal influence so to increase the number of members and life of the museum that the future of so valuable an institution may not be a matter of doubt.

THE NATIONAL SMOKE ABATEMENT INSTITUTION.

A WELL-ATTENDED meeting, convened by the Council of the National Smoke Abatement Institution, for the consideration of the Bill now before the House of Commons to amend the Smoke Abatement Acts, and for business connected with the institution, was held on July 16 at the Mansion House. The Lord Mayor presided for a short time, and was succeeded by Mr. Mount-Temple.

The annual report, which was read by Mr. Hart, stated that the past year was really the best which the movement had worked in an organised manner, and had had the opportunity of indicating and demonstrating its practical utility. In most of the large towns, as in numerous smaller places where the public opinion of the institution had been freely circulated, the necessity of abating smoke had been generally recognised, and the subject was now one of active public discussion. In the opinion had been expressed with marked emphasis that the year, and the attention of sanitary boards had been called to the injurious effects of smoke on health. At the last annual meeting some of the large bakers had adopted the improved gas-heated and other

were now worked without any smoke whatever, turning out large quantities of bread prepared under more cleanly and healthy conditions. A number of gas engines now used in London was at 6,000, and the uses of smokeless coals and for heating purposes had also largely increased. The Council thought a Royal Commission should be appointed to inquire into the means of preventing smoke, and application had been made to the Government, but that they were not disposed to grant one. It was introduced by Lord Stratheden and Campbell provisions for the supervision and control of the arrangements of all new buildings, including houses, in order that smoke from them might be prevented. It further provided for local authorities empowered to create, subject to the approval of the Secretary, by-laws for the restraint of smoke in certain districts, as well as to extend the provisions of the Smoke Abatement (Metropolitan) Acts to the metropolitan police districts, and to include chimneys and furnaces which were not at present included. (See SANITARY RECORD for June 15, p. 591.) The mortality from smoke and fog was so great as to have led to great epidemics. There had only been one in London that had caused more deaths than that traced to fog and smoke. The resolution was introduced by Lord Stratheden and Campbell, who expressed his hope of being able to carry his Bill through the House of Lords.

Mr. Pollock next moved: 'That this Council has with satisfaction, the introduction into the House of Commons of the Smoke Nuisance Abatement Bill by Lord Stratheden and Campbell, and that it trusts that this Bill will receive favourable consideration from Parliament on the view to the adoption of such means as may be necessary to abate the evils arising from the excessive production of smoke within the metropolis.' This was seconded by Mr. George Shaw, chairman of the City Sanitary Board, who said he believed if the Bill proceeded on the lines they had already entered upon it would meet with great success. The resolution was carried *unanimously*, and the proceedings closed with a vote of thanks to the Lord Mayor and the Council.

VACCINATION OFFICERS' ASSOCIATION.

A monthly meeting of this association was held at the Cross Hospital Medical School on Saturday, June 15. Mr. C. Shattock in the chair, Dr. Henry Stevens, President of the Local Government Board, being present. The members proceeded to consider Dr. Cameron's report made in the House of Commons upon July 1, 1883, to the system of vaccination practised in the metropolis compared to that pursued in Glasgow during times of epidemics, and resolved to request each member of the association to furnish the secretary with the following information:—1. To show how promptly on the action of the vaccination officer the protection of vaccination can be given to those in infected houses. 2. Any instances in which prompt action has illustrated its advantages. Mr. O. Elkerton (honorary secretary), in calling attention to the pamphlet issued by the National Health Society upon the subject of vaccination, proposed the following resolution:—

That the members of the Vaccination Officers' Association hereby express our most cordial thanks to the National Health Society for the pamphlet issued by them, which calls the attention of the public to facts concerning vaccination; and would further desire to mark their appreciation of the thoughtful kindness which prompted the National Health Society to assist the vaccination officers of the metropolis in the discharge of their difficult

distributed, and most beneficial results had accrued from their so doing—as the attention of the public was thereby not only called to the protection afforded by vaccination, but it also convinced them that the Vaccination Acts were for their benefit. That the truth about vaccination should be known to the public was most important; and when 'Facts concerning Vaccination' were placed before those capable of receiving evidence, there could be no doubt about the good this pamphlet would do. There are always a certain number of people who obstinately refuse to be convinced either by arguments or results, with whom—as members of this association were well aware—it required more than ordinary patience to deal. Experience proved that opponents do not draw the line of opposition at vaccination. Objection here and there must be expected by officers; hence the necessity of the law. It would be difficult to name any Act of Parliament universally accepted as an unqualified blessing. When one knows that some people object to soap and water, and others to policemen, it cannot be matter of surprise that some object to vaccination. It is a matter of history that there are people so peculiarly constituted that everything is objectionable to them but the sound of their own voice, raised in execration against everybody and everything; and it would be well for all if such people could be inoculated with an idiosyncrasy against their own voice. In the early days of our association a strong wish was expressed that we should become rich enough to publish for public information statistical evidence bearing upon the benefits of vaccination. That we have been anticipated so kindly by the National Health Society is a matter of congratulation for them and for us. The literature issued by anti-vaccinationists has been permitted to permeate and poison the public mind for a long period uncontradicted, and the abusive language employed by anti-vaccinationists against the issue of this pamphlet is the strongest possible proof that the National Health Society can have of the great good it has done. It is the old tale, 'No case—bully the plaintiff's solicitor.' It is sincerely to be wished that this pamphlet will act only as a pioneer to a series of such publications.

Vaccination officers cannot call individually upon every client, bringing under their notice evidence of the protective power of vaccination; and this pamphlet will go a long way to help officers in their duty, and prove an antidote to antagonistic perversions of facts. It would be a source of further assistance to officers if the higher authorities would place in their hands official records of statistics, which in some instances they help to compile. Being supposed to be always ready with arguments founded upon statistical evidence, it is not too much to expect that the means should be ready to their hands. Opponents have been very busy in the distribution of their publications, and the result, as recently reported, ends in a 'conscientious objection,' sympathetically condoned by the fine of half-a-crown. Some day, perhaps, the vaccination officer will be allowed the benefit of legal assistance to conduct a prosecution, and be placed otherwise than at a disadvantage when his duty compels him to take legal proceedings.

Mr. W. B. Croft seconded the resolution, and, referring to the issue of the pamphlet in Fulham, spoke of the good results obtained. Some Boards of Guardians, while averse to the system of a house-to-house visitation, as an alternative published the pamphlet, and it was considered by many that equally good results had been obtained.

The resolution was then formally put to the meeting and carried unanimously.

THE CRYSTAL PALACE ELECTRIC AND GAS EXHIBITION AWARDS.

On the 6th inst. the Duke of Buckingham and Chandos presented the awards to the exhibitors at the Crystal Palace International Electric and Gas Exhibition of 1883.

The secretary stated that in St. George's Union the Council had ordered 21,000 of these pamphlets to be

The ceremony took place on the great Handel orchestra of the Crystal Palace.

The awards distributed were in connection with the gas section of the exhibition, and the following is the list of the awards:—Gold medal for the Grimston regenerator gas burner (exhibited by G. Bower); gold medal for F. W. Clark's regenerative gas burner (exhibited by the Portable Gas Apparatus Company); silver medal for Sir James N. Douglass's burner (exhibited by the Improved Gas and Oil Burners Company, Limited); silver medal, William Sugg & Co., Limited, for gas burners. For Flat-flame Burners with governors: Another silver medal to William Sugg & Co., Limited; and for Flat-flame Burners in lanterns, a further silver medal to William Sugg & Co., Limited. For Incandescent Burners: Silver medal for the Clamond burner (exhibited by E. Servier); silver medal for the Lewis burner (exhibited by G. Bower); and silver medal, Albo-Carbon Light Company, Limited, for their method of increasing the illuminating power of gas. For Cooking Stoves: Silver medal, H. C. Davis & Co.; silver medal, J. Wright & Co.; silver medal, General Gas Heating and Lighting Company, Limited; silver medal, Waddell & Main; and silver medal, Strode & Co., for their summer and winter stove. For Close Heating Stoves: Silver medal, John Wright & Co.; silver medal, General Gas Heating and Lighting Company, Limited; and silver medal, William Sugg & Co., Limited. For Asbestos Fuel Stoves: Silver medal, West Brothers. Tile Stoves: Silver medal, General Gas Heating and Lighting Company, Limited; and Reflector Stoves: Silver medal, Strode & Co. For Instantaneous Water Heaters: Silver medal, William Sugg & Co., for Thermo Heater; and silver medal, Strode & Co. For Gas Governors: Silver medal, James Stott & Co. The general awards were: Diploma of honour, George Glover & Co., for the general excellence of their exhibits; diploma of honour, W. Parkinson & Co., for the general excellence of their exhibits; silver medal, Pintsch's Patent Lighting Company, Limited, for their gas apparatus; silver medal, Thompson's Smokeless Kiln and Oven Company, Limited, for their kiln; silver medal, The Portable Gas Apparatus Company (F. W. Clark), for their apparatus for manufacture of gas; and silver medal for Fletcher's apparatus for the application of gas to heating purposes (exhibited by Deane & Co.).

BAD SMELLS.—Numerous complaints from all parts of London, including the House of Commons, have lately been made respecting more offensive smells in almost all parts of London. As regards those noticed at the Houses of Parliament it is stated that they arise partly from the sewers and partly from manufactories. The same is said of those which are referred to in Old Ford, Bow, and Hackney, with the addition of most foetid smells from the Lea and its outfall into the Thames. There is no doubt as to the correctness of the complaints, but they are chiefly evolved from manufactories, and carried to a considerable distance before they descend to ground level. Thus, although there are very few offensive businesses carried on in Hackney, yet most objectionable smells are said to pervade the parish either from the Haggerstone Gas Works, or from manufactories at Bow, Poplar, and Stratford. As usual, these works are under the divided control of three authorities—viz., the Metropolitan Board of Works, and Local Sanitary Authorities in the metropolis, chiefly the former, and the Local Government Board outside London. Now as the three parishes just named are adjacent to Stratford, which is outside the metropolis, the Local Government Board is responsible for the continuance of the smells given off in that place. Under these circumstances, those who suffer do not know to whom their complaints should be addressed. It is quite true that in this, as in other sanitary matters, there should be greater unity of action in the oversight of offensive trades, and more simplicity as well as rapidity in proceedings for the removal of nuisances.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

'Something attempted, something done.'

BELPER RURAL.—Mr. Gaylor prefaces his the Alfreton division of this district with son remarks setting out the leading features of the statistics, and the principal items of sanitary plan which might well be adopted by all health large and straggling rural districts. In some water supply has been improved, but owing to and other difficulties many of the inhabitants continue to use their wells and pumps although mains almost pass their doors. The drains received particular attention from Mr. Gaylor, that no fresh communications between the sewers inside of houses have been permitted. In many an entirely new arrangement has replaced the old, this is costly it cannot be proceeded with. Scarlet fever caused some trouble at Alfreton prevailed extensively during the last half of 1888 ten deaths. Altogether zymotic diseases destroyed lives, representing a death-rate of 1.12 per mortality from all causes being equal to 16.6 in 1,000. In reporting on the other portion of the district, Mr. Allen discusses at some length the fatality from preventable causes, which he summarizes in a very able and convenient manner. He does not rehearse to his authority the many lessons which the prevalence of these diseases should inculcate, and he urges them that their first duty is to provide proper accommodation. At Kirk Langley there was an outbreak of scarlet fever which baffled all efforts to trace but from subsequent investigation in another part of the district, Mr. Allen is of opinion that pedlars often play an important part in spreading disease. Measles and whooping-cough caused two out of a total of twenty-eight attributed to the zymotic diseases. The general death-rate was 14.0 per 1,000, which would be satisfactory enough if it were not for the large mortality registered among children. In various villages schemes for the extension of water supply are in progress, and special attention has been directed towards improving the mode of disposal, by abolishing cesspits and erecting earthenware and ash-pits in their stead. For the Alfreton division Mr. Gaylor reports a death-rate during 1883 of 16.6 per 1,000 against an average of 14.69 for the previous eleven years. Thirty-eight per cent. of the total number of deaths occurred amongst children under five, and 30.5 amongst persons aged sixty and upwards. In the division the general rate of mortality was equal to 14.9 per 1,000. More than one-third of the whole of the deaths happened at the threshold of life, as referring to the subject Mr. Allen animadverts on the system of life insurance amongst children. Diseases destroyed twenty-three lives, scarlet fever accounting for eleven deaths.

BOURNEMOUTH.—The year 1882 was one of unusual activity in Bournemouth, for during this period an elaborate system for flushing and ventilating the main sewers, which Mr. Nunn describes as one of the best sanitary improvements effected for many years. Boscombe and Springbourne the inhabitants were complying with the notices directing the connection of their house-drains with the extended sewers, and a portion of the town no little improvement will result from the discontinuance of the offensive soak-pits. Progress is being made in this respect, Mr. Nunn draws the serious attention of his authority to the grave danger caused by a large deposit of refuse, which, by offensive putrefaction, disgusts a whole neighbourhood. Obviously this is not right or politic, and steps are being taken for relieving the district of an evil so justly

l of. Estimating the population at 18,000, and ing the deaths of visitors, the death-rate is as low as per 1,000. Whooping-cough was the most fatal of motics, causing 19 deaths, 8 being referred to s. In referring to the prevalence of infectious , Mr. Nunn laments the absence of a hospital, and hat his authority will promote the erection of a g so essential to the welfare of their district, which inaply described as a national sanatorium. The e of this provision was severely felt during 1883, the ation of scarlet fever into the district being attended erious pecuniary loss both to the patients and the y-house keepers. The lesson, however, has not st upon the authority, who at length have resolved eed with the erection of a hospital. Indeed, at the e report the plans had already been passed, and un observes that the building, when completed, e one of the most perfect in the kingdom. The of refuse removal still needs improvement, and in ortion of the town overcrowding exists to a dan- extent. The death-rate, after deducting the deaths ors, was as low as 7.36 per 1,000.

SETT.—The dwellings of the poorer classes in this seem to be in a terrible condition. Many of the s have scarcely more than a yard of ground save 1 which they stand, and some are absolutely without The offices in such cases are crowded close to the or built on to the pantry. Bedroom accommodation entably deficient; in very few dwellings are there han two bedrooms provided, and in most of them is only one. It is the exception, Dr. Renton es, to meet with a cottage with fireplaces in its bed- and where the fireplace is absent proper ventilation room is impossible. Having regard to these con- it is not surprising to learn that there was a high f mortality recorded for 1882, in which zymotic : largely figured. There was some prevalence of eria and of enteric fever, mostly in a sporadic form, he exception of two outbreaks of this last disorder were undoubtedly due to a specifically polluted here. An extensive epidemic of measles began in and terminated in the autumn, but of some hundreds s eight only proved fatal. The total number of registered in the district was 166 (of which 83, or r one-half were those of children under five), return- leath-rate of 21.7 per 1,000 against 14.8 recorded in

The sanitary condition of the district is very ive. House accommodation is of the worst possible excrement removal is imperfectly carried out, and, consequence, masses of filth abound. Dr. Renton properly advises his authority to take under its own al control the cleansing, whitewashing, and disin- g of the ashpits and privies, if this nuisance, second n order of gravity of the sanitary evils of the district, e overcome. Some progress was made during the a the extension of the main sewers, and in the sub- on of water-closets for offensive privies; but it is s that much more remains to be done. During the sewerage system continued to progress, and there decided improvement in the scavenging of the town, is to be regretted that the authority cannot be pre- upon to undertake the cleansing of ashpits and s. Dr. Renton, who has much of interest to say in l to the dwellings of the poor in his district, returns neral death-rate at 14.3 per 1,000, which, with one tion, is the lowest recorded since the adoption of the Government Act.

'PLACE TO LIVE IN.—The Cleethorpes Medical Officer ealth, in his quarterly report, states that in that t, with a population according to the last census of t, there was no death from March 27 to May 17, only eaths from May 17 to June 7, and five during the der of the quarter. The total death-rate for the as 9.6 per 1,000; deducting premature deaths and mts, 5.2 per 1,000.

SANITARY INSPECTORS' REPORTS.

ASTON MANOR.—Mr. Bolt's report contains a record of much patient and methodical work, which was carried out without the necessity of having recourse to legal proceedings in any single case. An inspection of the bake-houses of the district showed but too clearly that they stood in need of sanitary supervision, no fewer than 22 being found in a filthy condition. The larger portion of the 1,193 notices that were issued were readily complied with. In 244 instances the drains were repaired and cleansed, in 214 wet and dilapidated middens were reconstructed, and in 102 house-drains were disconnected from the sewers. An immense number of visits were paid to the slaughter-houses, &c., and proper observation was exercised over nuisances caused by the emission of smoke. A house-to-house inspection of one portion of the district revealed the existence of numerous sanitary defects, which were promptly remedied. During the year the inspector collected 180 samples under the provisions of the Food and Drugs Act 1875, and submitted them to the public analyst, with the result that 17 vendors were proceeded against and fines amounting to 42*l.* were inflicted.

BEDMINSTER RURAL.—Mr. Marsh's report would deserve notice if only for the fact that it has been prepared without having recourse to statistical statements. There are, however, signs of much good work of an unpretending character having been performed during the year. Particular attention was directed towards maintaining the existing drains in a proper condition, in supervising the construction of new sewers, and in examining all house connections. The water supply of the district was considerably improved by the extension of the public water mains to Easton-in-Gordano, the inhabitants of which had hitherto been dependent upon the water running in the road. The inspector does not record the number of nuisances disposed of, but he shows that some cases of overcrowding were abated, and that disinfection was energetically carried out during the prevalence of scarlatina.

BELPER RURAL.—Considerable extension was made in the water service of this district during 1882, no fewer than 973 houses, with 4,643 occupants, having been supplied. To secure this Mr. Clexton issued 472 formal notices upon owners and agents, all of which were complied with, and later on 313 official orders. These, however, did not receive such prompt recognition, since at the close of the year 76 were outstanding. At Wain-grove a number of wells were protected on the representation of the inspector, who submitted 117 samples of water for analysis. In reference to works of drainage, Mr. Clexton's report is not so complete as could be wished, as he gives no details of his labours in this direction beyond stating that a considerable portion of his time was occupied in superintending the making and connection of drains. A number of houses, water- and dry-earth closets, receptacles, &c., were erected, and plans for similar structures were submitted for examination previous to the works being commenced. The inspector states that he notified 552 nuisances, a large proportion of which were abated, but no information as to their nature appears in the report. Mr. Clexton's report for 1883 is written in the same lines as its predecessor. Thus, amongst other items, he states that he inspected 2,046 dwelling-houses and reported 998 nuisances, which, however, are not specified. This is an obvious defect, and one that should be remedied in future. The inspector seems to have been active in his district, and there are signs of the performance of good work, though Mr. Clexton does not make this so clear as could be wished.

CHESTER-LE-STREET RURAL.—In his tenth annual report Mr. Barras gives a succinct account of the sanitary work performed by him during 1883. Reference is again drawn to the increasing number of nuisances that arise from offensive accumulations, and to the fact that the

Authority can satisfactorily dispose of them by contracting for the regular removal of refuse, under section 42 of the Public Health Act. Having regard to the danger arising from the retention of the contents of privies and ashpits, and to the success that has invariably followed the adoption of this section elsewhere, it is to be regretted that the Chester-le-Street Authority have not thought fit to follow the advice of their inspector. The year witnessed the performance of some useful sanitary work, though in the south-west portion of the district there is an obvious need for an extended water supply, which unfortunately the Water Company cannot so far be prevailed upon to provide. With a view to securing a more prompt response to the notices issued for the abatement of nuisances, &c., Mr. Barras suggests that he should be empowered to take legal proceedings as soon as the order expires.

COVENTRY URBAN.—Like its predecessor, Mr. Booker's report is excellently arranged, no point of importance being overlooked. Much work seems to have been done towards maintaining the district in a sanitary state and free from nuisance. Ninety water-closets were provided with proper flushing arrangements, 50 houses were supplied with town water, 105 sink drains were disconnected, and 115 filthy and unwholesome dwellings were cleansed and limewashed. Fifteen privies were abolished, 17 were repaired, and 50 were converted into water-closets. In eight instances overcrowding was abated, while ten houses were closed as unfit for habitation. Altogether, 712 improvements of more or less importance were effected, as compared with 610 in the previous year. Two proceedings were taken against the retailers of meat unfit for food, one of whom was mulcted in a substantial penalty, and six butchers were summoned for neglecting the by-laws relating to slaughter-houses. In other respects much useful work was performed.

DONCASTER RURAL.—Very considerable progress was made in this district last year. The whole of Balby was lighted with gas, the streets named, the houses numbered, and the drainage arrangements almost completed. At Bentley a new sewer was laid in place of an open offensive ditch, at Braithwell a public well was protected from pollution, and at Ardwick additional sewers were laid. In other parts of the district special attention was directed to the cleansing of wells and brooks, and to the flushing and ventilation of the sewers. Out of 164 notices issued by Mr. A. Wright, the surveyor and sanitary inspector, 20 related to water, 71 to drainage sink-pipes, 15 to privies and ashbins, and 30 to pig nuisances. The report does not show, however, how many of these notices were complied with.

EAST DEREHAM.—The first portion of Mr. Nankivell's report is occupied in an attempt to refute the belief held in some quarters that the prosperity of the town is declining, and in so doing he gives some useful statistics of the sanitary work that has been performed since the completion of the schemes of water and sewerage. He reports that there are now supplied with water from the Public Works, and connected with the sewers, some 146 water-closets, of which 53 belong to cottage property and 93 to private houses. The addition of a properly equipped closet to cottages is no inconsiderable improvement, the more so when it is remembered that the majority of these dwellings under the old system were scarcely fit for habitation from the proximity of defective and ill-constructed middens. Mr. Nankivell properly exercises much supervision over the connection of house drains with the public sewers, and he has been well advised in adhering to the principles set out in the model by-laws of the Local Government Board. The sewage farm continues to work well, the value of the crop of osiers being estimated at over 20*l*.

GOOLE RURAL.—The report of Mr. Tudor, C.E., the surveyor and inspector of this district, is statistical only; but it contains a record of the performance of much useful work. During 1883 as many as 1,140 yards of

new main drainage were laid in various portions of the town, 8,190 yards of foul stagnant village watercourse were cleansed, 104 house-drains were examined and 20 constructed, 56 old brick cesspools were removed, and 29 houses connected with the new sewers. Mr. Tudor made 550 inspections, and abated 300 nuisances. A considerable number of ashpits and privies were reconstructed, 27 premises were disinfected after the prevalence of infectious disease, and the lodging-houses were inspected, cleansed, and limewashed.

GOOLE URBAN.—Mr. J. F. Hedley reports that during 1883 he made 1,240 inspections, reported 176 nuisances and abated 142. Ten common lodging-houses were registered, 33 premises were disinfected, 42 ashpits were either repaired or covered and ventilated, 32 cesspools were replaced with pot gullies, and 50 box-closets were renewed; 334 yards of new sanitary pipe-drains were laid to houses, and 170 yards of open watercourse were cleansed. Five nuisances were in the course of abatement at the date of the report.

HALIFAX.—Mr. Travis gives an interesting account of his work in this borough during 1883, particularly as regards the removal of refuse. In addition to recording that the Goux system is rapidly extending, the inspector notes with satisfaction that the authority have themselves resolved to undertake the cleansing of ashpits, a step of considerable importance. During the year 10,960 loads of night-soil and 7,445 loads of refuse were collected, both figures exhibiting an increase as compared with previous reports. The streets appear to have been systematically scavenged, though the staff at the disposal of the inspector does not permit this to be done as frequently as is to be desired. As many as 2,480 nuisances were disposed of, involving the inspection of 5,600 dwellings, and the issuing of 711 notices. More than 200 houses were dealt with on account of the existence of infectious disease; but the present system of disinfection seems to be of a very partial kind, and the inspector urges his authority to no longer delay the erection of some suitable and effective disinfecting ovens.

SELBY RURAL.—Mr. Christie's report is brief; but it contains some not unimportant details. During 1883 the inspector made 425 visits, discovered 285 nuisances, and issued 152 notices. No fewer than 4,080 yards of drainage were repaired and cleansed, whilst 1,037 yards of new sanitary pipes were laid by private persons and 945 by the authority. Other items of the report refer to the building and repairing of ashpits, the cleansing of cesspools, the disinfection of houses, and the disconnection of sink-pipes.

SELBY URBAN.—For this district, which has a population of 6,029 persons and an area of 3,643 acres, Mr. Mallinson has little of interest to record. The principal event of the year, as reflected by this report, seems to have been the cleansing of 1,050 yards of Holme Dyke. But 38 notices were issued by the inspector, and 19 by the sanitary authority, for the abatement of nuisances, and it is not clear what success attended these applications. Thirteen drains were cleansed and repaired, 7 houses were provided with spouts, four water-closets were ventilated, and a few other minor improvements were effected.

TADCASTER RURAL.—Mr. Denham's report, although statistical only, contains abundant evidence of systematic and painstaking work. The year witnessed a considerable extension in the drainage of the district (3,913 yards of pipes having been laid), and in the provision of properly trapped gullies. In addition to this, a considerable number of minor sanitary improvements were effected. Thus, 109 sink-pipes were disconnected, 47 old ashpits and privies were destroyed, 468 gullies and drains were repaired, 70 pigstyes and manure heaps were removed from against dwelling-houses, and 120 houses were whitewashed or stoved. In the course of the year 496 nuisances were discovered by Mr. Denham, and in all but 55 cases they were abated upon first application.

WEST HAM.—The report of Mr. W. Horn as chief inspector of this enormous and ever-growing urban district gives an excellent idea of the amount of work which the sanitary supervision of such a district necessarily entails. Mr. Horn is grateful to the 'scare' for the impetus it gave to his work in the detachment of sinkpipes from drains, the removal of water-closet flushing pipes from cisterns for drinking water, and the removal of such cisterns in situations where the water was liable to be polluted with sewer gas. More than 8,000 houses were visited in 1883, and the total number of premises dealt with amounted to 1,192. Some of these premises had to be visited half-a-dozen times before the necessary work was done. Nearly 400 special complaints of nuisances were attended to, and 410 cases of infectious diseases were reported.

The work of disinfection was lighter than in the previous years; but 163 rooms and about 5,000 lbs. of bedding and clothing had to be subjected to the process of fumigation. Sixty-two samples of food (butter, cheese, and milk) were submitted to analysis, and 14 samples for adulteration obtained. A substantial share of the West Ham sanitary staff is taken up in the provision of the offensive trades that flourish in the district.

It is satisfactory to find that Mr. Horn is fully alive to the importance of this department of his work.

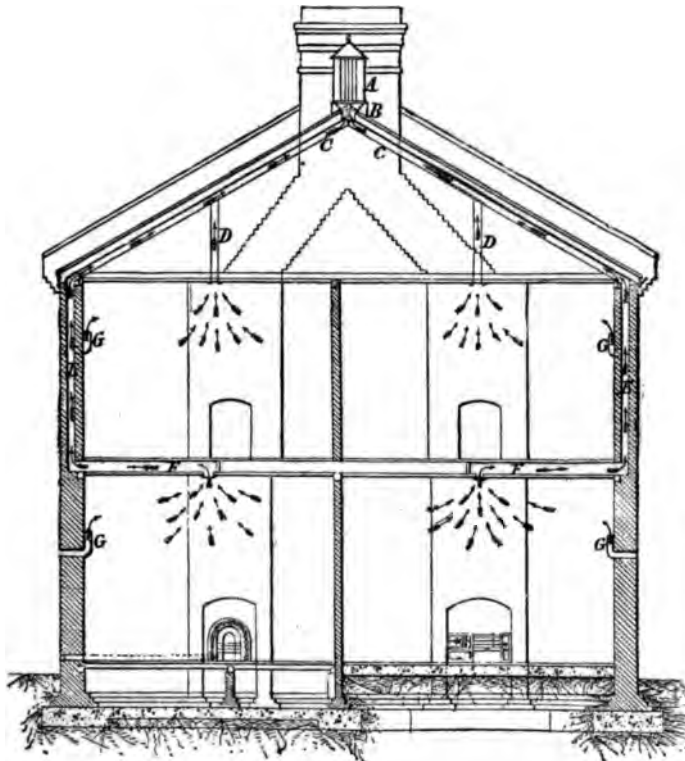
NEW INVENTIONS.

MR. S. BOYLE'S NEW ECONOMICAL SYSTEM OF VENTILATION FOR WORKMEN'S HOUSES.

This system of ventilation has been introduced by Messrs. Boyle & Son, Ventilating Engineers, 64 Holborn, London, and Glasgow, intended for workmen's houses and

ventilation could be produced at a cost that would enable it to be applied to even the poorest houses, it would tend very considerably towards the improvement of the public health, as it is a fact well known to all medical men and sanitary officials that the pestiferous atmosphere which generally exists in the houses of the poorer classes is one of the causes of many of the diseases and fevers which perpetually haunt the more densely-populated parts of all towns. This fact, and the necessity of some economical system of ventilation, was pressed upon Messrs. Boyle's attention as far back as ten years ago by Mr. Edwin Chadwick, C.B., but they were not in a position then to act upon his suggestions. They, however, did not lose sight of the question, and only awaited the time when the public mind would be fully alive to the importance of the subject and the necessary attention drawn to it, which would enable them to submit the system with good hopes of it being adopted. That time Messrs. Boyle believe has now arrived, and the accompanying diagram shows the arrangement they propose to apply for the purpose of securing a constant extraction of the foul air and supply of fresh air to each apartment without the slightest draught being felt by the occupants, as it is a common experience that where ventilating openings are made which admit of draughts they are at once closed up and rendered useless as ventilators.

A (see diagram) is a Boyle's patent self-acting air-pump ventilator, 16-inch diameter, fixed on the ridge of the roof. This ventilator continually extracts the foul air, and is entirely free from down-draught. B, main shaft, 8-inch diameter, with divisional plate in centre to prevent the currents from the branch pipes striking each other and creating a swirl which would be injurious to the ventilation. CC, 5-inch diameter branch pipes connecting ventilator with 4½-inch flues in the walls. DD, 4-inch diameter pipes connecting upper rooms to branch pipes by means of 4-inch diameter holes cut in centre of ceilings. EE, 4½-inch flues in walls communicating with spaces, FF,



uses of the poor. Messrs. Boyle have been long of opinion that if some simple and efficient system of ventilation could be produced at a cost that would enable it to be applied to even the poorest houses, it would tend very considerably towards the improvement of the public health, as it is a fact well known to all medical men and sanitary officials that the pestiferous atmosphere which generally exists in the houses of the poorer classes is one of the causes of many of the diseases and fevers which perpetually haunt the more densely-populated parts of all towns. This fact, and the necessity of some economical system of ventilation, was pressed upon Messrs. Boyle's attention as far back as ten years ago by Mr. Edwin Chadwick, C.B., but they were not in a position then to act upon his suggestions. They, however, did not lose sight of the question, and only awaited the time when the public mind would be fully alive to the importance of the subject and the necessary attention drawn to it, which would enable them to submit the system with good hopes of it being adopted. That time Messrs. Boyle believe has now arrived, and the accompanying diagram shows the arrangement they propose to apply for the purpose of securing a constant extraction of the foul air and supply of fresh air to each apartment without the slightest draught being felt by the occupants, as it is a common experience that where ventilating openings are made which admit of draughts they are at once closed up and rendered useless as ventilators.

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GGGG, air inlet brackets, 10" x 5" x 3", one fixed in the corner of each room furthest from opening in ceiling, and about 6 feet from the floor.

Messrs. Boyle do not submit this system with the view of deriving a profit from it. It is introduced solely and exclusively for the benefit of the working and poorer classes, and with no other object, as the following figures will, we think, conclusively demonstrate, they being, we are given to understand, the *net cost* of the material and time making up same, nothing being allowed for other expenses incurred, Messrs. Boyle bearing those themselves. One 16-inch diameter Boyle's patent self-acting air-pump ventilator, made of galvanised iron, and painted, 1½ ft. 8 in. diameter pipe, with dividing plate, 30 ft. 5 in. diameter pipe, 8 ft. 4 in. pipe. Two 5-inch junctions, two 5-inch knees, two 5-inch flanges, two 4-inch junctions, two 4-inch knees, four air inlet brackets, 10" x 5" x 3". All the above, made of strong galvanised iron, is sold at four guineas complete. A plan and printed instructions is also supplied along with each set of appliances. The system can be adapted to tenements at the same rates, every room in the largest tenement being ventilated separately. It can also be applied to existing buildings at a trifling extra expense.

We think the Royal Commission on the dwellings of the poor, of which H.R.H. the Prince of Wales is so active a member, could not do better than give a little attention to this practical solution of the problem how to ensure pure air in the homes of the poor which has as yet been submitted to the public, and we hope to see others follow in the footsteps of Messrs. Robert Boyle & Son in their laudable and disinterested endeavours to improve the condition of their poorer brethren, and make their existence more bearable than it is, or ever can be, under the present conditions. Such endeavours are doing good service to the State, of which Messrs. Boyle are useful citizens.

RAYNER & CO.'S LIME-FRUIT SYRUP.

THE business of Messrs. Rayner, Farringdon Road, the manufacturers of Rayner's Lime Juice—which is one of the best of the preparations of the lime as a syrup—is about to be formed into a company for the purpose of extending the operations of the firm; the intention of the company being to acquire lime groves of their own in the West Indies, and so become growers of the fruit as well as manufacturers of lime juice. In connection with the Lime Fruit Syrup made by this firm, a letter appeared in the columns of the *British Medical Journal* of June 14 last, from Dr. John Thompson, M.D., F.R.C.S., who has been a great sufferer from psoriasis. He has found Rayner's Lime Juice the best remedy for the disease of any that he has tried, and says that he now prescribes it to all his patients suffering from this distressing skin disease, and that he is satisfied that the Lime Fruit is a valuable remedy. Doubtless Rayner's Syrup is not the only one suitable for the cure of psoriasis; but this preparation has a freshness of flavour that contrasts favourably with many others, which is probably the reason why Dr. Thompson selected it in preference to other makes.

A NEW FIRE EXTINGUISHER.

MANY inventions taking the name of 'Extincteurs' and Fire Annihilators, are now manufactured, and each of them can lay claim to different merits, but while useful for public buildings, large mansions, and generally speaking, the wealthier classes, the price of them is prohibitive to small householders. What is required is a simple and reliable appliance that shall be at all times ready for use, not requiring any supervision to keep it in working order, and that can be sold at a price the working-man can afford to pay. Such an invention, of American origin, is now under consideration; and perhaps no one but an American would

have conceived the idea of making such an appliance of an ornamental character, so that it may stand upon a sideboard or bracket in a sitting-room, without attracting special notice. The Harden 'Star' Hand Grenade Fire Extinguisher, of the Company bearing that name, whose London address is Southwark Bridge Road, supplies the desiderata already enumerated. It is simply an ornamental opaque glass bottle hermetically sealed, containing one pint of a chemical fluid which when broken over fire, if in not too advanced a stage, is sufficient to completely extinguish it. It may happen that one bottle will not always have this effect; that must depend upon the progress the fire has made; but from what the writer recently saw at a public exhibition of the capabilities of this Fire Extinguisher, he was astonished at what was accomplished by the contents of one bottle, and when it is pointed out that the price of this ingenious invention is only three shillings and ninepence, it may well be asked who will so neglect their own safety as to be without a fire extinguisher? A new danger is no amongst us; for whatever advantage mineral oils have provided in the shape of a cheap light-giving medium, is none the less a fact that they are constantly productive of fires, and even loss of life. During the winter months the newspapers constantly record accidents arising from the use of mineral oil lamps which, unfortunately, are mostly confined to the homes of the working class. Last winter a great deal of space was devoted in the SANITARY RECORD to this question, and the makers of the lower-priced kinds of lamps were asked to endeavour to introduce some contrivance by which, if a lamp was overturned, the light should be automatically extinguished. Publicity was given at that time to an invention in this direction, which there is reason to hope will be properly placed at the service of the public during the coming season. In addition to the advantages of the 'Star' Hand Grenade for temperate climates like our own, it is equally useful in any climate, as it withstands the changes of atmosphere to which it is likely to be subjected, is said not to deteriorate with age, and will not freeze 20° below zero. In the experiments witnessed, which took place in the open air, a wooden chimney about one foot square by 14 feet high, well coated inside with Stockholm tar, was set alight by a fire ignited in the lower part. When thoroughly in a blaze with about 4 feet of solid flame emerging from the top, one of the bottles was broken over the fire at the lower part, and in a quarter of a minute was entirely extinguished. A small hoarding similarly coated with tar, and afterwards soused with petroleum was also ignited and allowed to become one mass of flame. This was extinguished by the contents of one bottle in about six seconds. Extraordinary as this may appear, the probability is that had the fluid been used for a fire in a room or covered building, it would have accomplished its work in even less time, as it must be quite evident that a large portion of the gas generated must evaporate into the open, which would be retained in a closed apartment. A further advantage possessed by the fluid contained in the bottles is that fabrics of any kind are not injured by coming in contact with it, neither does it affect the floor injuriously. Thus every safeguard appears to be provided for in the 'Star' Hand Grenade, and, with one of these always standing in the principal rooms of a house, the danger of a fire proving disastrous is likely to be reduced to a minimum.

THAT excellent organisation, the New York St. John Guild, which has been in existence since 1866, hopes to continue its excursions this summer for the benefit of its children. Last summer the floating hospital made thirty-two regular excursions and twelve extra excursions, caring 29,189 children and mothers or guardians. The St. John side nursery also did good work in keeping children several days or a week in the country. Many children with diarrhoeal diseases had their lives saved by its means.

REVIEWS.

*onal Health Exhibition—Handbooks. Ambulance
isation, Equipment, and Transport.* By Surgeon-
G. J. H. Evatt, M.D., Army Medical Depart-
London: William Clowes & Sons, Limited.

ATT has written a very excellent handbook upon a
of great practical importance. He has understood
mission in a wide sense, and, while giving an
e and condensed account of the military ambu-
stems, and War Ambulance Aid Societies of
ountries, he has not failed to devote some space
lance systems for civil life. For any complete
of civil ambulance relief we must look abroad,
y to the great cities of the United States, for in
we have no organisation by which help can be
rendered in case of accident in streets or factories,
most rude methods of transporting the injured and
d nothing like a complete system of hospital relief.
perhaps as yet regard with some natural suspicion
like the scheme which Dr. Evatt believes to be
le, namely, to make the rates responsible for all
ies in hospital finances, a scheme which, we appre-
ould quickly end in making hospitals municipal
ons supported entirely by the rates; but most
gree with him in believing that it would be very
etter for the patients if existing hospitals were
into receiving hospitals where only severe cases
e retained, the less severe cases and the convales-
es being drafted off by ambulance trains to linked
s on well-chosen suburban sites. The account given
Railway Ambulance and Sick Transport systems
dingly interesting, and the luxuries of Dr. Baron
s ambulance train, the property of the Souveranen
r Ritter Ordens Gross-priorat von Böhmen, will
prise to those whose ideas of railway comfort for
k have never risen above one side of a compart-
this train, besides the engine and guard's van,
of a sleeping carriage for the knights and medical
a store-wagon, a kitchen-wagon, with every
e for cooking on a large scale, a dining wagon,
balance sick transport carriages, each carrying ten
s lying on comfortable suspended stretchers, and a
ne wagon containing the linen store, and dis-
r. Such a train is of course the extreme of ambul-
luxury, but Dr. Evatt carries the reader step
p from the most simple contrivances to arrange-
more and more complicated, until Baron
's train ceases to be so entirely unprecedented as
seem from our description. Dr. Evatt speaks in
f well-deserved praise of the admirable organisa-
the Metropolitan Asylums Board for conveying
ox cases to the floating hospital at Long Reach,
ves a plan and section of the ambulance steamer
now, now running on the Thames. (See EXHIBITION
D for July 26.) We can speak in high terms of
ndbook; no subject is neglected, none treated at
ate length, and all are illustrated by helpful drawings.

following recipe for making rice-water will be
useful at this season. Take a dessert-spoonful of
each pint of water, let it boil three or four hours,
and flavour with lemon-juice and sugar. This
will at once arrest such diarrhoea as proceeds from
er food or from slight internal irritation or inflam-
t, and is likewise sufficiently nourishing for persons
g from such derangement in hot weather.

ORDING to the returns of the Commissioners of Inland
ue, the consumption of spirituous drinks per head of
ulation is still on the decline. In Scotland, how-
be returns of duty on spirits consumed as beverage,
on the contrary, an increase amounting last year to
3 gallons, or over 34 per cent. as compared with the
year.

CORRESPONDENCE.

[All communications must bear the signature of the writer,
not necessarily for publication.]

SEWAGE DISPOSAL.

I have lately read several articles in the daily and other
papers with reference to the fouling of the Thames by the
solid matters contained in the sewage which is discharged
into it.

In the year 1878 Sir Joseph Bazalgette estimated this
quantity of solid matter at 88 tons each tide, or 64,240
tons per annum. Assuming an increase to 136 tons at
each tide, or 100,000 tons per annum, is the drying and
disposal of this quantity such an arduous task that the
Corporation of the richest city in the world should hesitate
to undertake it? No doubt the cost of works would be
great; but nothing in comparison to the cost of conveying
the whole of the sewage to the German Ocean, as well
as losing 100,000 tons of such valuable material, with the
certainty of its being driven back to pollute the shore.

The only article of value which science has hitherto
succeeded in extracting from the sewage is the sludge
itself, which, when unadulterated with chemicals, contains
2 per cent. of ammonia, and has an analytical value of 30s.
to 35s. per ton. This analytical value can be easily con-
verted into a commercial value, leaving an ample margin
for profit even upon a small undertaking. Sewage sludge
can be reduced to a dry powder, and be mixed with other
ingredients and put into bags ready for the market at less
than 7s. 6d. per ton.

There are several ways in which it can be treated and
turned to profitable account. Either of the following
processes could be carried out on the banks of the Thames,
instead of saddling the ratepayers with a burden, which
can never be removed if the alternative scheme of
conveying the sewage to the ocean be adopted. The
first process consists in adding sulphuric acid to the
dried sludge, putting the mixture into an ordinary kind of
purifier and then passing through it the gas generated
from the distillation of ammoniacal liquor. The product
will contain 40 per cent. of dry sulphate of ammonia, and
at the present price of the materials used, inclusive of
labour, the cost of production will be several pounds per
ton less than the market value of the article produced.

In the second process, the dried sludge may be distilled
to furnish the ammonia, in lieu of purchasing gas liquor;
the cost in either case will not vary more than a few
shillings per ton, the latter being, in all probability, the
cheapest on account of the large volume of gas (nearly
5,000 cubic feet per ton) which would be generated and
used for heating purposes, and other bye-products not yet
ascertained.

In other words, 100,000 tons of dried sewage sludge can
be so manipulated as to produce 26,000 tons of manure,
analysing 10 per cent. of ammonia and 18 per cent. of
re-precipitated phosphates, at a price that will leave a
clear margin of several pounds per ton, to pay for depre-
ciation, management and profit, when sold in competition
with other manures of the same analytical value.

If any of your readers are at all sceptical on this point I
shall be pleased to give them convincing proof of the
accuracy of my assertions. JOHN HOWARD KIDD.

Westminster Buildings, Wrexham.

THE COMMUNICABILITY OF ENTERIC FEVER.

Though, I fear, no longer young, as it is now fourteen
years since I anxiously watched the surgeon whose pupil I
was, through a fatal attack of typhoid, I am in a position
similar, though not identical, with that of the 'young
doctor' alluded to by M. S. E. in the SANITARY RECORD
for July 15.

I entered into a friendly discussion with our sanitary
inspector on an interesting and important question. I

have always repudiated the epithet 'old fogies,' which he attempted to put into my mouth, and I do not sneer at those who happen to differ from me, as I think it wrong to enter into a serious discussion in the spirit of M. S. E.

To show with what respect I treat those who hold an opposite opinion, I cannot do better than to quote the letter I addressed to the *Lancet*, together with the editorial reply.

Sir,—I lately saw two cases of enteric fever under treatment in the general medical ward of a large metropolitan hospital. I have always understood that, provided the excreta were immediately disinfected and removed, this practice was absolutely free from danger to the other occupants of the ward. Bristowe says: 'It is admitted by probably all physicians that enteric fever is not, in the usual sense of the term, contagious; that it is not conveyed from one person to another by the touch or by the breath; and that attendants on the sick rarely, if ever, take the disease from them.' In private practice I have always acted in accordance with this belief, and though I have placed before the friends the advisability of removal to a fever hospital, I have never urged it as a necessity. I have, however, heard that theory as to the mode of communication warmly disputed by men who have every opportunity of forming a decision. I should be glad if you would tell me what opinion is held by the majority of the profession on the subject. I have never seen any ill consequences arise from my procedure, even amongst the very poor; but I would gladly abandon it if I were convinced that it was fraught with danger. An authoritative statement would relieve me of much anxiety, as our medical officer of health holds a different opinion from mine.

I am, sir, yours truly,

June 23, 1884.

DILEMMA.

We should say emphatically that the majority of hospital physicians agree with Dr. Bristowe and our correspondent.—ED. L.

I am glad to see that Dr. Collie apparently agrees with me when he says:—

'And when one thinks that the infective matter of the enteric fever patient is for the most part contained in his stools; that these are passed into vessels which are immediately removed from the ward and emptied into the drains, *there remains nothing* to infect the non-enteric patients in a general ward.' [The italics are mine.]

July 22, 1884.

X. Y. Z.

HOUSING OF THE WORKING CLASSES.

*'How best to help the slender store,
How mend the dwellings of the poor?'*

WILSON'S BUILDINGS, CITY OF LONDON.—In consequence of some remarks made by a jury when investigating the circumstances of a suicide at Wilson's Buildings, Lower Thames Street, Dr. Sedgwick Saunders has recently made a special inquiry into the condition of the houses. He reports that they are a portion of an old hotel, and were purchased by the Government for the accommodation of some of the *employés* of the Custom House, fifty years ago. When no longer required for this purpose the dwellings were leased to a private person, upwards of thirty years ago, and had been let in tenements ever since. There are nineteen tenements in the block, in holdings of five of three, nine of two, and five of one room respectively, in all thirty-eight rooms, occupied by persons varying in number from fifty to sixty; the rooms are of fair size, and as a rule are, and have been, kept fairly clean. The owner is a respectable solicitor, who holds possession from the Crown, and who, Dr. Saunders reports, has never failed to fulfil the requirements of cleansing and repairing for which the sanitary department has, from time to time, served official notices. The buildings are principally built of wood and plaster, the back walls only being of brick. They comprise four tiers of apartments, approached by one

very steep, narrow wooden staircase. Four tenements only have back or through ventilation, and although the cubic contents per person of the whole of them are not far below the necessary limit, the back rooms are devoid of light, and so entirely without ventilation, that Dr. Saunders thinks them unfit for human habitation. He advises that the case should be referred to the Sanitary Committee for them to view the premises and determine what further steps should be taken either to render them fit for healthy dwellings, or to insist on such structural alterations as may be recommended.—The new town, for such it deserves to be considered, which the Improved Industrial Dwellings Company are erecting in Soho is now rapidly approaching completion; so large a portion indeed is already prepared to receive its future inhabitants that the twenty-first anniversary of the society's foundation was recently celebrated by an opening ceremony, at which the Prince and Princess of Wales presided. The precise spot is that which was very lately known as Newport Market, together with Porter Street and adjacent courts and alleys—the whole closely abutting on the line of the projected new street from Charing Cross to Oxford Street. The company acquired the land on which Sandringham Buildings stands from the Board of Works last September, since which time their official surveyor, Mr. Borer, and his foreman, Mr. Hickie, have been busily engaged in directing the operations of an army of workmen. The blocks of buildings, including the shops, will provide altogether about 1,000 rooms apportioned in separate tenements of two, three, and four apartments, the three-roomed holdings being found to be in most request, as being best suited, if not to the wants, at least to the means of the classes for whom they are intended. Although as yet only 124 sets in Sandringham Buildings are completed, Mr. J. Moore, the secretary, has already had 400 applications for them; while others are coming in at the rate of forty or fifty a day. Each set, not excepting the two-roomed tenements, is absolutely complete in itself, and provided with an outer door, neatly painted and grained, with a knocker and letter-box. Between this and the inner door is a useful space, in which is a little washhouse, with sink, cupboards, and sanitary conveniences, including a very ingenious dustshoot, which compels the inmate to burn vegetable refuse, paper, and so forth, instead of hoarding it up to breed fever, and this for the simple reason that only dust and fine ashes will go down. Inside, the apartments are prettily papered. Each kitchen has a copper and a kitchen-range, and it is an invariable rule that no room shall be without one of the fireplaces, with their really artistic little sides and chimney-pieces, which the association manufacture for the purpose. The windows are each divided into three sashes, instead of the ordinary two, the short lower division being fixed for the safety of little children. Over every door, moreover, is a swinging fanlight, so that draught is maintained at the ceiling level 8 feet 6 inches from the ground throughout every tenement. It would not be easy to give an intelligible description of the double current atmospheric system of ventilation of the closets; it is important, however, to note that every pipe throughout the blocks connected with the sewers is carried some distance above the roofs and open. The success of the 'horizontal system' of ventilation in the rooms is sufficiently attested by the fact that in no one of these vast buildings have the company ever known a case of infectious disease being communicated from floor to floor. From the health point of view it is an important fact that, precious as space is, no less than half an acre is set apart for playgrounds, not to speak of nearly a quarter of an acre more in the shape of odd bits, which are distinct additions to the breathing spaces. The company give preference to families that have been displaced by the pulling down of houses in the neighbourhood. The height of the blocks is 62 feet. All staircases are of a fireproof material, formed of consolidated coke-breeze and Portland cement, manufactured—like nearly all other materials used—by the company itself.

on the roof—the sixth landing from the ground, is a road flat space, in one corner of which is a well-fitted general washhouse—the only detail of the system which is of common use.

THE thirteenth annual meeting of the shareholders of the Newcastle-upon-Tyne Improved Industrial Dwellings Company, was held at the company's offices Newcastle, on the 25th ult., under the presidency of Mr. James Hall, J.P., the chairman of the company. The report, which was of a cheering character, and recommended the payment of a dividend of 3½ per cent., was adopted unanimously. After the re-election of the retiring directors and other formal business, the chairman said that there probably was not another company in England which carried out the spirit of the Act more completely than they did. They made it their business to furnish excellent accommodation for the genuine labouring poor; as many of the men who left their dwellings in the morning did not know whether they would be able to meet with employment for a single hour, much less for a day or a week, they were essentially giving effect to the Act. The same remarks did not apply to other companies located elsewhere, which paid better dividends. When they looked into the working of those companies which were able to pay 5 per cent., they would find that they did not accommodate the same class of labourers, which the Newcastle company did, but persons in a superior position in life. In Newcastle they found that their tenants were utterly unable to pay the high rents, which could be so readily obtained in London for similar accommodation; at the same time it should be remembered that they had to pay the same rate of interest and repayment of principal to the Public Works Loan Commissioners, as the London companies, who were so much more advantageously situated. Considering the laudable work in which they were engaged he thought that they were entitled to exemption from house duty, which pressed hard on them, and to which they had been subjected on a mere technical point, whilst most of the London dwellings enjoyed immunity from that burden. Mr. John Price, resident director, reported that the birth and death-rate for the year ending June 30 were rather above the average of the city, the latter arising from exceptional causes, in no way connected with the sanitary condition of the buildings—one child having fallen out of a window and was killed immediately, and some infants died very soon after birth; the general rate of mortality in the buildings since their erection being much lower than that of the rest of the town during the same period. Mr. Price also stated that, being resident on the premises, he devoted several hours daily to the inspection of the water-closets, sinks, and drains, and otherwise strove all in his power to preserve the good sanitary condition of the buildings, though, as may be expected with such a class of tenants, his duties were by no means a secure. The company's block comprises 108 dwellings, with an average population of 500 persons, most of the tenants being labourers, dependent on casual employment at the wharves or steamboats at the neighbouring quay-side.

At the Convocation of the Clergy of the Northern Province, held at York on the 17th ult., under the presidency of His Grace the Archbishop of York, the President, in moving 'That it is important that the clergy should take an active interest in questions affecting the homes and health of the people,' said that this question had now assumed very great prominence. The work of the clergy was only now beginning. The labourers of England were very numerous, and that fact would unhappily forbid the use of mercenary provision of dwellings for them. What were the clergy to do in promoting health and decency? His Grace urged that sanitary associations should be formed in every town similar to that which existed at Hull; and commended and implored clergymen, who from their position were above suspicion, to take greater interest in matters affecting the public health, and to make themselves acquainted with sanitary matters. In that way, and with

the joint action of municipal authorities, pressed on by an enlightened public opinion, a great deal might be done. The poor died by thousands for want of remedial measures. Constant pressure should be brought to bear upon public opinion and upon municipal authorities. If mothers in slums were taught that their dark, dirty, drainless, horrible dwellings were dangerous and deadly to the children whom they loved, they might move them to aspire to better dwellings and more comfortable conditions for their children. An interesting discussion followed, in which several of the leading clergy in the diocese took part. Much good is anticipated from this action of the Convocation.

PARKS AND OPEN SPACES.

*The law condemns both man and woman
Who steals the goose from off the common;
But lets the greater felon loose,
Who steals the common from the goose.*

OPEN SPACES AS PLAYGROUNDS FOR CHILDREN.—Referring to the rumour that a railway company are seeking powers to obtain the whole or part of the space known as the 'moor,' Mr. Harris, in his last report on Sunderland observes that the moor is the great resort of the children of Sunderland parish, and without it the district would suffer from a much higher mortality than at present, heavy though that may be. The moor stands much in the same relationship to the district that the lungs do to the blood circulating in the human body—it supplies it with pure air, giving tolerably free scope to the wind to sweep down and purify the stagnant atmosphere of the neighbouring streets. If the moor is ever to be changed, it should be changed not into railway sidings, or costly parks, but into a proper playground for children, in which they would not be afraid of trespassing on the grass, but where they could freely exercise their limbs, and in which the corporation should erect swings and other means of recreation as in other towns. Ornamental parks are, Mr. Harris adds, most desirable acquisitions to large towns, affording untold pleasure to the adult population, but of no service to the neglected children of the slums, who do not patronise them, but who, nevertheless, require the health-giving powers of pure air.

'OUT-DOOR SITTING-ROOMS.'—On Aug. 2 Lady Selborne presided at the ceremony of opening the St. Nicholas disused burial-ground in Wellington Street, Deptford, as a garden and public recreation ground. The Kyrle Society have borne the expense of laying out the plot, which covers about an acre of ground, and has the advantage of an avenue of trees down the centre. The duty and cost of maintaining the ground in order will be undertaken by the Local Vestry and the Greenwich District Board. The Rev. Brooke Lambert, on behalf of the Kyrle Society, thanked her ladyship for her attendance, and moved the customary vote of thanks, which was seconded by Mr. W. J. Evelyn, J.P. and carried. The churchyard of St. Peter's, Hackney Road, which has been tastefully laid out with beds of flowers and provided with seats by the Kyrle Society, has been opened as a recreation ground for the use of the public by the Bishop of Bedford. The Bishop of Bedford, in the course of a short address, expressed his gratification at the amount of pleasure which the society had been able to afford to the poor in various parts of the metropolis, by laying out and opening for their use churchyards and disused burial-grounds. He hoped the grounds he was about to open would be a place of beauty and attraction for the poor of that neighbourhood. Consequent upon the exertions of the Metropolitan Public Garden, Boulevard, and Playground Association, Ebury Square, Pimlico, has been thrown open for public use and recreation. Nearly an acre has, through the action of Lord Brabazon, Mr. Ernest Hart, and others connected with the association, been

added to the open spaces at the West End of the town, which the public may freely use.

In his last report on the sanitary circumstances of Tottenham, Dr. Tyndale Watson makes a plea for the provision of a people's park and the establishment of swimming baths. It is to be regretted, he observes, that some of the fine open fields on rising ground between Lordship Lane and Phillip Lane could not be utilised as a public park. This would form a pleasant health-resort, and if swimming baths were attached, it would be still more valuable. We hope with Dr. Watson that the suggestion may meet with a response from the inhabitants, who number nearly 66,000, and that the exercise of some public spirit may lead to practical results.

THE Arboretum at Walsall, an area of seventeen acres, eight of which are water, has been opened by the Mayor and Corporation as a public recreation ground. The price paid was £4,000, Lord Hatherton, the chief original owner, having merely charged money out of pocket. Three other grounds are to be opened hereafter—one, Reed's Wood, which was obtained from the Earl of Bradford, containing forty-six acres.

SANITARY JOTTINGS.

SANITARY.

MR. JOHN PRICE, who has been for the last fourteen years resident director of the Newcastle Improved Dwellings Company, has been invited by the committee to read a paper on 'The Housing of the Poor' at the ensuing Diocesan Conference, to be held in Newcastle on October 29 and 30.

The Local Government Board have forwarded to the Corporation of Gateshead copies of Dr. Barry's reports of the sanitary condition of the borough, with special reference to the prevalence of infectious disease in the district, and also reports and suggestions for the prevention of nuisances by the removal of refuse or excrement. The matter was referred to the Sanitary Committee. The chairman said they all knew the difficulty they experienced in getting the work done efficiently by the contractors.

CONGRESSES.

SANITARY INSTITUTE OF GREAT BRITAIN.

THE Autumn Congress, 1884, will be held at Dublin from Sept. 30 to Oct. 4, 1884. The sections of the Congress will be constituted as follows:—

SECTION I.—'SANITARY SCIENCE AND PREVENTIVE MEDICINE.'

President.—Thomas W. Grimshaw, M.A., M.D., F.R.C.S., and Q.C.P.I., Registrar-General for Ireland.

Honorary Secretaries.—J. F. J. Sykes, B.Sc., Pub. Health, M.B., L.R.C.P., M.R.C.S.; E. MacDowell Cosgrave, M.D.; George F. Duffey, M.D., F.R.C.S., Q.C.P.I.

SECTION II.—'ENGINEERING AND ARCHITECTURE.'

President.—Charles D. Cotton, C.E., M.Inst.C.E., Engineering Inspector Local Government Board for Ireland.

Honorary Secretaries.—W. R. E. Coles; J. P. Griffiths, M.Inst.C.E.; W. Kaye Parry, M.A., C.E.

SECTION III.—'CHEMISTRY, METEOROLOGY, AND GEOLOGY.'

President.—Charles A. Cameron, M.D., Sc.C.Camb., City Analyst and Superintendent Medical Officer of Health for Dublin.

Honorary Secretaries.—H. Percy Boulnois, M.Inst.C.E.; R. J. Moss, F.C.S.; J. Byrne Power, D.Sc.; C. R. C. Tichborne, LL.D.

Papers and Discussions.—Authors are reminded that the acceptance of Papers, and the days on which they are to be read, are as far as possible determined by the Council before the beginning of the meeting. The Council reserve the right of refusing any Paper sent in; and in the case of those accepted, the reading of them must depend upon the time at the disposal of the Council. No previously published Paper can be read. Papers read at the Congress cannot be published by the authors, unless by permission of the Council. The Council reserve to themselves the privilege of printing any Paper read at the Congress, either wholly or in part, or of refraining from the publication thereof, if they see fit. Papers are limited to twenty minutes in reading, and the discussion upon them to ten minutes each speaker. In order to give an opportunity to the Council of doing

justice to the several communications, and to assist the Transactions, each author should prepare an abstract and send it, together with the original manuscript, by 6 or before September 1, addressed to the Secretary, Sanitary Institute of Great Britain, 74A Margaret Street, W.

Authors whose Papers have been received and accepted will be furnished with printed copies before the commences Congress.

NOTICES OF MEETINGS.

THE annual meeting of the Association of Municipal Engineers and Surveyors was held in the Town Hall, N. Tyne. The members assembled under the chairmanship of Mr. White, of Oxford, the retiring president. He afterwards, the president-elect, Mr. W. G. Laws, City Engineer of who, in an able inaugural address, briefly glanced at the tant matters which are now engaging the attention of Mr. J. P. Spencer, of Newcastle, read a paper on the 'In Testing of the Sanitary Arrangement of Houses,' in which he pressed considerable doubt as to the possibility of the Sanitary Authority devoting the requisite time for a thorough examination of all the houses in their district, and therefore Sanitary Associations were a necessity to a great extent. He then gave an interesting description of what he regarded efficient mode of testing drains, both by the smoke and tests. Lieut.-Col. Alfred S. Jones, of Wrexham, read a paper on 'Best Practicable and Available Means of Rendering Sewage Harmless,' which excited a lively discussion.

THE first general meeting of the North-Eastern Sanitary Inspection Association was held at their offices, Newcastle, on July 17, under the presidency of Sir Ma Ridley, M.P. The chairman, in moving the adoption of the Association (which stated that 222 members had joined the association the year), said he felt strongly the extreme desirability of such an association as this in the north of England and elsewhere. He appeared to him that the association supplied a great want, and he thought they had reason to be satisfied with the work done. He was somewhat surprised that it had not been so well. Landlords and tenants were bound to turn to sanitary matters—not only because cholera might be the country, but because an idea was getting abroad that to pay more attention to the health of their families and themselves. He had considerable confidence in coming to him for a report on his own house, and he hoped that they would be content with anything short of annual inspections. He had the newest portion of his house was in the worst condition, and he had no doubt others would find the same thing. Dr. Spence, in seconding the adoption of the report, quoted figures that the public sanitary officials of the county of Durham possibly make annual inspections of every house. The Corporation should welcome this association as a valuable body, and he stated that they had under consideration what could be done for the houses of the poor.

COMPETITIONS.

INTERNATIONAL INVENTIONS EXHIBITION, 1885.

Amongst the classes of products notified to be at this Exhibition are the following, likely to be of interest to the subscribers to the SANITARY RECORD:—

DIVISION I.—APPARATUS, APPLIANCES, PRODUCTS, AND INVENTIONS, INVENTED OR BROUGHT INTO USE SINCE 1862.

GROUP I.—AGRICULTURE, HORTICULTURE, AND ANIMALS.

CLASS 3.—*Dairy and Poultry-farm Appliances.*—Machines, cream-separators, churns, cheese-making apparatus for manufacturing butterine, incubators.

GROUP II.—MINING AND METALLURGY.

CLASS 8.—*Machinery and Appliances used in Quarries.*—Ventilating, lighting. Aids to respiration. Life-saving appliances. Utilisation of waste.

GROUP III.—ENGINEERING CONSTRUCTION AND ARTS.

CLASS 13.—*Roads.*—Methods and materials for constructing paving roads; cleansing roads and pavements; machines; rollers; apparatus for the removal of mud, water-carts and other means of watering. CLASS 19.—*Water and Sewerage.*—Methods of collecting, pumping, storing and distributing water; appliances for detecting and preventing water, water-meters; water fittings, filters; sewers, disposal and utilisation. CLASS 20.—*Reclamation, Irrigation, and Drainage of Land.*—Drainage (natural and artificial) districts; irrigation works. CLASS 23.—*Materials used in Building.*—Bricks and tiles, machines for making them; concrete, stone, cement, materials and appliances used in their manufacture; roofing felt, and other roofing materials; colour and other applications of metal in building; applications of metal to buildings; preservative and fire-resisting materials.

&c., for application to stone, wood, iron, &c.; methods of applying the same. CLASS 24.—*Building Construction*.—Models and plans showing methods of construction; non-combustible constructions; labour saving and other machines and appliances used in building, scaffolds, elevators; fittings and appliances used in buildings. CLASS 25.—*Heating, Ventilation, House-drainage, &c.*—Sanitary appliances; ventilators; cowls for chimneys, chimney-sweeping apparatus; apparatus for heating by steam, water, air, &c.; means of cooling air.

GROUP IV.—PRIME MOVERS, AND MEANS OF DISTRIBUTING THEIR POWER.

CLASS 26.—*Steam-engines and Boilers*.—Methods and appliances for preventing explosions, and for testing boilers; fire-grates, fire-feeders, smoke-consuming appliances; pumps.

GROUP VI.—COMMON ROAD CARRIAGES, &c.

CLASS 36.—*Bicycles and Tricycles*.—'Cycles' of every description, and fittings for the same.

GROUP XI.—HYDRAULIC MACHINES, PRESSES, MACHINES FOR RAISING HEAVY WEIGHTS, WEIGHING, &c.

CLASS 59.—*Pumps, hand, steam, rotary, centrifugal*.—Ships' pumps, pumps for corrosive fluids; hydropulps; syphons; methods of raising water; methods of obtaining, distributing, and equalising hydraulic power; accumulators. CLASS 60.—*Fire-engines*.—Fire-extinguishing apparatus; automatic apparatus for indicating and extinguishing fires; fire-escapes, ladders, fire-hose, accessory fittings and appliances; hydrants.

GROUP XIV.—APPARATUS, PROCESSES, AND APPLIANCES CONNECTED WITH APPLIED CHEMISTRY AND PHYSICS.

CLASS 76.—*Inorganic Products, and means used in obtaining them*.—Sulphuric and other acids, alkalies and ammonia, bleaching agents, dyes and dye-stuffs, salts, white lead, pigments, and other pigments, phosphorus, lucifer matches, disinfectants. CLASS 79.—*Organic and Synthetical Products, and means used in obtaining them*.—Coal tar products, oils, soaps, and detergents, lubricating agents, candles, perfumery, paraffin, varnishes, manures.

GROUP XV.—GAS AND OTHER ILLUMINANTS.

CLASS 81.—*Coal Gas*.—Manufacture, purification, storage, and distribution of gas; treatment of residues. CLASS 82.—*Water Gas, Oil Gas, Carburetted Air, &c.* CLASS 83.—*Tests and Photo-metrical Apparatus*.—Chemical tests; standards of light; measurement of light. CLASS 84.—*Burners, and means of Utilising and Applying Gas*.—Gas fittings; burners for illuminating gas; devices for imparting luminosity to flame; gas-meters; methods of lighting gas; methods of increasing illuminating power of gas. CLASS 85.—*Mineral and other Oils*.—Methods of obtaining; distilling and refining; testing. CLASS 86.—*Candles, &c.*—Candles of wax, tallow, sperm, paraffin, &c.; nightlights, appliances used in the manufacture. CLASS 87.—*Lamps for Oil and Spirits, Holders for Candles, &c.*

GROUP XVI.—FUEL, FURNACES, &c.

CLASS 88.—*Manufacture of Fuel*.—Materials and processes for the manufacture of artificial fuel; preparation and use of liquid fuel; preparation of peat; charcoal burning. CLASS 89.—*Furnaces for Manufacturing Purposes*.—Furnaces for burning solid, pulverised, liquid and gaseous fuel. CLASS 90.—*Stoves for Coal, for Gas, for Oil, &c.*—Cooking stoves and kitchen ranges; domestic fire-places; gas cookers; gas burners for heating and cooking; petroleum and other stoves for heating and cooking.

GROUP XVII.—FOOD, COOKERY AND STIMULANTS.

CLASS 93.—*Preserving Food*.—Methods, materials, and processes for preserving animal and vegetable food, machines for producing cold. CLASS 94.—*Bread and Biscuit Making*.—Kneading machines, biscuit and bread-making machines, ovens; processes for making bread. CLASS 95.—*Cooking Apparatus*.—Culinary utensils, chopping and mincing machines, apparatus for paring and slicing fruit and vegetables, cleaning fruit, washing and cleaning vegetables. CLASS 96.—*Brewing, Distilling, and Wine-making*.—Machines and appliances connected with the manufacture and use of alcoholic drinks. CLASS 97.—*Manufacture of Aerated Waters*.—Machinery, materials, &c., used for the purpose. Stoppers and other appliances. CLASS 98.—*Infusions*.—Apparatus, &c., used in the preparation and use of tea, coffee, chocolate, &c.

GROUP XVIII.—CLOTHING.

CLASS 100.—*Fabrics*.—Specimens of new materials, or materials recently applied to the manufacture of clothing. CLASS 101.—*Articles of Clothing*.—Specimens of clothing of novel construction. CLASS 103.—*Cleaning Clothing*.—Washing and wringing machines, mangling, &c., machines; boot-cleaning machines; machines and processes for cleaning other articles of clothing.

GROUP XX.—LEATHER.

CLASS 107.—*Methods of waterproofing, &c., leather*.

GROUP XXI.—INDIA-RUBBER AND GUTTA-PERCHA.

CLASS 110.—*Applications of India-Rubber and Gutta-Percha*.—Waterproof goods.

GROUP XXII.—FURNITURE AND ACCESSORIES.—FANCY GOODS.

CLASS 113.—*Floor-coverings and wall-coverings (other than Paper-hangings)*.—Oilcloth; linoleum, kamptulicon; mats and matting; material, appliances, and processes used in their manufacture.

GROUP XXIII.—POTTERY AND GLASS.

CLASS 120.—*Bricks, Tiles, Earthenware, &c.*—Architectural pottery; fire-clay goods; drain-pipes.

GROUP XXVI.—PAPER, PRINTING, BOOKBINDING STATIONERY, &c.

CLASS 137.—*Machines and Processes for the Manufacture of Paper, Paste-board, and Papier-Mâché*.—Paper; recovery of waste products, and preventing the pollution of streams.

GROUP XXXI.—TOYS, SPORTS, &c.

CLASS 163.—*Toys, Games, and Exercises*.—Gymnastic apparatus.

THE INSTITUTION OF CIVIL ENGINEERS.

THE Council have awarded the following Premiums in respect of the Original Communications referring to Sanitary Subjects submitted during the Session 1883-84:—

The Manby Premium to George Henry Stayton, Assoc. M. Inst. C.E., for his Paper on 'Wood Pavement in the Metropolis.'

A Telford Premium to William Santo Crimp, Assoc. M. Inst. C.E., for his account of 'The Wandle-Valley Main Drainage.'

APPOINTMENTS UNDER THE PUBLIC HEALTH ACT.

MEDICAL OFFICERS OF HEALTH.

BYRDEN, Robert Thomas, L.R.C.P. Edin., L.R.C.S. Edin., has been re-appointed Medical Officer of Health for the Windhill Urban Sanitary District, Yorkshire, at £35 for one year.

BUCHANAN, Dr. Peter, has been appointed Medical Officer of Health for the Coleford Urban Sanitary District, Gloucestershire, at the rate of £20 per annum until March 25 next, *vice* Hutton resigned.

DONOVAN, Denis Dempsey, L.R.C.P. Edin. and L.M., L.R.C.S. Edin., L.A.H. Dub., has been appointed Medical Officer of Health for the Cork Urban Sanitary District, at £150 per annum, *vice* Cremen, resigned.

FLETCHER, Charles William Corrie, L.R.C.P. Edin., and L.M., M.R.C.S. Eng., has been re-appointed Medical Officer of Health for the Willington Quay Urban Sanitary District, at £40 for one year.

HARRIS, Charles, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the No. 3 Division of the Rye Rural Sanitary District, at £25 for one year.

LOYD, William Howell, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Llandilo Fawr Rural Sanitary District, Carmarthenshire, at £50 per annum, *vice* Jones, deceased.

LUNDY, Louis Francis, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Staines Rural Sanitary District, at £75 for one year, from Aug. 11.

MACGREGOR, George Robert, M.D. Univ. Aberd., L.R.C.P. Lond., has been re-appointed Medical Officer of Health for the Wilsden Urban Sanitary District, Yorkshire, at £20 for one year.

MASON, George, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Wisbech Urban Sanitary District, at £40, for the year ending June 24, 1885.

PALEY, William Edmund, M.B. Durh., L.R.C.P. Lond., F.R.C.S. Eng., has been re-appointed Medical Officer of Health for the Peterborough Rural Sanitary District, at £100 for one year.

PHILLIPS, Edward England, L.R.C.P. Edin., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Southend Urban Sanitary District, at £15 per annum, for three years.

POLLARD, William Robert, M.R.C.P. Edin., L.R.C.S. Irel., has been re-appointed Medical Officer of Health for the Church Urban Sanitary District, Lancashire, at £20 for one year.

SHORTIDGE, Thomas Wood, L.R.C.P. Edin., L.R.C.S. Edin., has been re-appointed Medical Officer of Health for the Honiton Urban Sanitary District, at £25 for one year.

SKINNER, Robert Vaile, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the No. 3 Division of the Rye Rural Sanitary District, at £15 for one year.

STOTT, Hugh, M.R.C.S. Eng. and L.M., L.S.A. Lond., has been appointed Medical Officer of Health for the newly-formed Friern Barnet Urban Sanitary District, at £37 for one year.

TAYLOR, Dr. Shephard Thomas, has been appointed Medical Officer of Health for the newly formed Cromer Urban Sanitary District, at £15 per annum.

THOMPSON, Abram, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Ulverstone Rural Sanitary District, at £133 per annum, for three years, from Sept. 30 next.

WALKER, John McClure, M.B., C.M. Univ. Glasg., has been appointed Medical Officer of Health for the No. 2 Division of the Alston-with-Garrigill Rural Sanitary District, at £20 per annum, *vice* Pickworth, whose appointment has expired.

WOODHAMS, John Amos, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the No. 1 Division of the Rye Rural Sanitary District, at £20 for one year.

SURVEYORS, CLERKS TO GUARDIANS, INSPECTORS OF NUISANCES, &c.

BEIK, Mr. Thomas John, Solicitor, of Middlesbrough, has been appointed Clerk to the Eston Local Board and Urban Sanitary Authority, Yorkshire, at £60 per annum.

- BROOKE**, Mr. Walter, Assoc. Mem. Inst. C.E. (Chief Assistant to Mr. E. B. Ellice Clark, Mem. Inst. C.E., Surveyor and Engineer to the Hove Urban Sanitary Authority), has been appointed Surveyor to the Richmond Urban Sanitary Authority, Surrey, at £300 per annum, *vice* Brunton, whose appointment has expired.
- BUXTON**, Mr. Samuel Gurney, banker, has been appointed Treasurer to the newly formed Cromer Local Board and Urban Sanitary Authority.
- BYFIELD**, Mr. George Dickinson, has been appointed Clerk to the Friern-Barnet new Local Board and Urban Sanitary Authority, at £100 per annum.
- CLARKS**, Mr. George, has been appointed Surveyor to the Friern-Barnet new Local Board and Urban Sanitary Authority, at £100 per annum, Inspector of Nuisances at £75 per annum, and collector at 3 per cent. commission.
- CROSS**, Mr. John, manager of the National and Provincial Bank of England, Poole, has been appointed Treasurer to the Poole Guardians and Rural Sanitary Authority, *vice* Hornsby, resigned.
- CURRY**, Mr. William, has been appointed Surveyor, Surveyor of Buildings, Inspector of Nuisances, Manager of the Waterworks, and Superintendent to the Fever Hospital, to the Bedlingtonshire Local Board and Urban Sanitary Authority, Northumberland, at £100 per annum, *vice* Rosser, resigned.
- DAVIDSON**, Mr. Robert, has been appointed Surveyor, Inspector of Nuisances, and Collector to the Howdon Local Board and Urban Sanitary Authority, at £15 per annum, *vice* Paul, resigned.
- DIGBY**, Mr. William King, has been re-appointed Treasurer to the Corporation and Urban Sanitary Authority of Maldon, Essex, at £30 per annum.
- EDGAR**, Mr. Robert, of the Halifax and Huddersfield Union Bank, Halifax, has been appointed Treasurer to the Northowram Local Board and Urban Sanitary Authority, *vice* Bowman, deceased.
- EVANS**, Mr. W. Scott, has been elected a Member of the Bournemouth Board of Improvement Commissioners and Urban Sanitary Authority, *vice* Elwes, resigned.
- FRANK**, Mr. R. has been appointed Collector to the Eston Local Board and Urban Sanitary Authority, at £35 per annum.
- HANSELL**, Mr. Peter Edward, has been appointed Clerk to the newly formed Cromer Local Board and Urban Sanitary Authority, at £25 per annum.
- HEATON**, Mr. C. W., F.I.C., F.C.S., has been re-appointed Public Analyst for the Parish of St. Martin-in-the-Fields.
- HEWITT**, Mr. C. G., has been elected a Member of the Gainsborough Local Board and Urban Sanitary Authority, *vice* Platt, appointed Inspector of Nuisances.
- HOWSE**, Mr. Henry, the Surveyor to the Aylesbury Local Board and Urban Sanitary Authority, has been re-appointed Inspector of Nuisances until December 24 next.
- KEMP**, Mr. John, has been appointed Surveyor to the Haverhill Local Board and Urban Sanitary Authority at £50, and Inspector of Nuisances at £50, both for one year, with the prospect of an additional salary as Manager of the Gas Works, both *vice* Coates, resigned.
- MELLOR**, Mr. Horace, has been elected Chairman of the Lytham Board of Improvement Commissioners and Urban Sanitary Authority, *vice* Pilling, resigned.
- MIDGLEY**, Mr. Robert, has been appointed Surveyor to the Midgley Local Board and Urban Sanitary Authority, Yorkshire, at £20 per annum, *vice* Fletcher, deceased.
- MILES**, Mr. John, has been elected Chairman of the Friern-Barnet new Local Board and Urban Sanitary Authority.
- MOON**, Mr. F., of the National Bank of Wales, has been elected Treasurer to the Bridgend and Cowbridge Guardians and Rural Sanitary Authority, *vice* Llewellyn, deceased.
- MYERS**, Mr. William, has been re-appointed Inspector of Nuisances for the Walker Urban Sanitary District, Northumberland, at £70 per annum for three years, from June 22; but sanctioned by the Local Government Board only for one year.
- NEWMAN**, Mr. John, has been appointed Surveyor to the newly formed Cromer Local Board and Urban Sanitary Authority, at £20 per annum, Inspector of Nuisances at £20 per annum, and Collector at £10 per annum.
- POTTER**, Mr. Edwin William, has been elected a Member of the Lytham Board of Improvement Commissioners and Urban Sanitary Authority, *vice* Pilling, resigned.
- POWELL**, Mr. William, has been appointed Road Surveyor to the Corporation and Urban Sanitary Authority of Croydon, at £250 per annum, rising to £300, *vice* Harlock, resigned.
- RICHARDSON**, Mr. William, has been appointed Clerk to the Oundle Guardians and Rural Sanitary Authority, at £75 per annum as Clerk to the Guardians, and such further salary as may be fixed from year to year, as Clerk to the Rural Sanitary Authority, to the Assessment Committee, and to the School Attendance Committee, and fees as Returning Officer and Superintendent Registrar of Births, &c., *vice* Mr. Robert Richardson, his father, deceased.
- ROBSON**, Mr. R., has been elected Chairman of the Wellington, Salop, Board of Improvement Commissioners and Urban Sanitary Authority, for the ensuing year, *vice* Slaney, resigned.
- ROPER**, Mr. George, has been appointed Surveyor to the Newbold and Dunston Local Board and Urban Sanitary Authority, Derbyshire, at twenty-four guineas per annum, *vice* Gould, resigned.
- SCOTT**, Mr. Walter, has been appointed Surveyor and Inspector of Nuisances to the Corporation and Urban Sanitary Authority of Ripon, at £120 per annum, *vice* Harrison, resigned.
- SHELDON**, Mr. John, has been re-appointed Inspector of Nuisances for the Long Eaton Urban District, Derbyshire, at £45 per annum.
- STAMP**, Mr. William Charles Blaspiel, has been elected a Member of the Hove Board of Improvement Commissioners and Urban Sanitary Authority, *vice* Holford, resigned.
- STOCK**, Mr. Henry Porter, has been appointed Treasurer to the Friern-Barnet new Local Board and Urban Sanitary Authority.
- TAPPER**, Mr. Charles, has been re-appointed Inspector of Nuisances for the Dawlish Urban Sanitary District, at the same salary as before, for two years.
- THOMAS**, Mr. William Roach (Messrs. J. Backhouse & Co., bankers), has been appointed Treasurer to the newly-formed Eston Local Board and Urban Sanitary Authority.
- WANKLYN**, Mr. Henry Charles, has been appointed Town Clerk and Clerk to the Urban Sanitary Authority of Colchester, at £250 per annum as Town Clerk and Registrar of the Courts of Record, and £225 as Clerk to the Urban Sanitary Authority, with £45 as Clerk to the School Attendance Committee, *vice* Philbrick, resigned (but who retains office as Solicitor to the Corporation).
- WATSON**, Mr. Isaiah, has been elected a Member of the Colne Local Board and Urban Sanitary Authority, *vice* Catlow, resigned.
- WHITE**, Mr. William Owen, has been appointed Inspector of Nuisances for the Banbury Rural Sanitary District, at £130 for one year, *vice* Morrison, deceased.
- WILSON**, Mr. Jacob, has been appointed Treasurer to the Boodle Guardians and Rural Sanitary Authority, *vice* Grice, resigned.
- WINTON**, Mr. Charles, has been appointed a Sanitary Inspector (additional) for the Parish of St. Pancras, at £90 per annum, rising to £100.
- WITHYCOMBE**, Mr. Edward George, has been elected a Member of the Ilfracombe Local Board and Urban Sanitary Authority, *vice* Gould, appointed Surveyor.

VACANCIES.

- MEDICAL OFFICER OF HEALTH** for the Nottingham Urban Sanitary District: £650 per annum.
- MEDICAL OFFICER OF HEALTH** for the New Forest Rural Sanitary District: £100 per annum. Application, 15th inst., to William Coxwell, Clerk to the Authority, Totton, Southampton.
- MEDICAL OFFICER OF HEALTH** for the Eston Urban Sanitary District.
- TREASURER** to the Corporation and Urban Sanitary Authority of Wigan: £400 per annum. Applications, 21st inst., to Maskell William Peace, Town Clerk.
- TOWN CLERK and CLERK** to the Urban Sanitary Authority of Wallingford.
- ACCOUNTANT** to the Corporation and Urban Sanitary Authority of Batley.
- SURVEYOR and INSPECTOR OF NUISANCES** to the Ely Local Board and Urban Sanitary Authority.
- SURVEYOR and INSPECTOR OF NUISANCES** to the Clevedon Local Board and Urban Sanitary Authority. Application (stating salary required), 23rd inst., to Henry Charles Fry, Clerk.
- INSPECTOR OF NUISANCES and SCHOOL ATTENDANCE OFFICER** for the Kidderminster Rural Sanitary District: £100 per annum, from year to year. Application, 19th inst., to Frederick Burcher, Clerk to the Authority.
- CHIEF INSPECTOR OF NUISANCES** for the Kingston-upon-Hull Urban Sanitary District: £150 per annum. Application, 18th inst., to C. S. Todd, Town Clerk.
- INSPECTOR OF NUISANCES** for the Doncaster Rural Sanitary District.
- COLLECTOR of Rates and Water Rents** to the Elland Local Board and Urban Sanitary Authority, Yorkshire: £75 per annum. Application, 28th inst., to Thomas England, Clerk, Town Hall Chambers, Halifax.

LOCAL INTELLIGENCE.

The Local Government Board, in pursuance of the powers given by the Alkali, &c., Works Regulation Act, 1881, have appointed Alfred Cooper Fryer, Doctor of Science, to be an inspector under the said Act to assist in the execution of its provisions, subject to the direction of the chief inspector, and of any inspector under whom he may from time to time be placed.

FRIERN BARNET has been constituted a Local Government District with a Board of nine Members, viz. Messrs. George Abbott, John George Brex, John Cleveley, Edmund Dixon, Edward Peter Elliott, Bowler Godbold, John Miles, Thomas James Phipps, George Sydney Waterlow.

Dr. Henry C. Libbey, the Medical Officer of Health for the Horsforth Urban Sanitary District, lately resigned because the Authority declined to increase his salary from £15 to £50 per annum. A special meeting was then held for the purpose of making an appointment, and Dr. Charles Jack, of Headingley, and Dr. Libbey (who proposed to undertake his duties again at the former salary) were candidates. The voting was even; and, as the chairman would not take the responsibility of giving a casting vote, no appointment was made.

The Brampton Guardians and Rural Sanitary Authority have been invested with the powers, rights, &c., of an Urban Sanitary Authority, under Sect. 39 of the Public Health Act, for providing and maintaining urinals, water-closets, earth-closets, privies, and ashpits, and other similar conveniences for public accommodation, within the contributory place of Brampton.

The Chertsey Rural Sanitary Authority have, with the sanction of the Local Government Board, increased the salary of the Inspector of Nuisances £20 per annum.

The Stafford Rural Sanitary Authority at their meeting on July 5 received and read a letter from the Local Government Board (in answer to the resolution reported in the *SANITARY RECORD*, July 13, page 42) stating that 'they, too, had only arrived at their decision

il review of the whole circumstances, and regretting that
cline to vary their decision.' Upon the motion of the
the further consideration of the matter was adjourned to
than a resolution 'That the subject be adjourned sine
ried by 20 to 3; and a motion 'That this be communicated
Government Board' was negatived. This is a curious
rs: a dead-lock for an indefinite period, and the district
or practically, without a Medical Officer of Health.
ment, although made by the Authority, is null until
the Local Government Board; and, being so, no salary
or be legally paid; if paid, it would be surcharged by

The question might then arise, supposing the Medical
lealth to be continuing to perform the duties all this
er he could not claim his salary from the individual
the Authority, who were present at the meeting at which
ent was made.

e White, the Surveyor to the Mexborough Local Board
sanitary Authority, has distinguished himself by pursuing
upwards of a mile, and shooting it; the animal was
e bitten five other dogs in its course.

ce of the Urban Sanitary Authority of Barnstaple recently
that the salary of Mr. William Garland, the Inspector of
ould be increased from £36 to £50 per annum. This
icated to the Local Government Board, and they wrote
g that, having regard to the duties devolving upon the
d the salaries paid in other similar districts, they enter-
doubt whether £50 was sufficient; they consented,
he appointment being made until June 1885, subject to
of salary being then reconsidered; but upon the matter
t before the Town Council, the proposed increase was
eventually negatived by a majority of one.

de a statutory meeting has been held, for the third time,
of a requisition signed by twenty ratepayers or owners,
wing resolution passed by a majority of eleven:—'That
it that the district or place (the boundaries of which
order dated July 5, 1884, been settled by the Local
Board under the provisions of the Public Health Act,
ich contain the whole township of Ambleside and certain
e townships of Appletrethwaite and Rydal and Loughrigg-
county of Westmoreland) shall be constituted a Local
District.' Many of the ratepayers and owners remained

bury Rural Sanitary Authority has been invested with
rights, &c., of an urban sanitary authority, under sect.
h No. 1, and sect. 163 of the Public Health Act, as to
gas or other means of lighting the streets, market, and
gs, within the contributory place of Thornbury Special
trict.

ry Rural Sanitary Authority has been invested with the
s, &c., of an Urban Sanitary Authority, under sect. 45
: Health Act, as to the collection and deposit of dust,
rbish, within the contributory places of Hershams
nage District, Oatlands Special Drainage District,
ames Special Drainage District, and Weybridge.

ent contained in sect. 90 of the Public Health Act,
be making of bye-laws as to houses let in lodgings, has
by the Local Government Board, to be in force within
rmet Urban Sanitary District.

ry Committee of the Town Council of Exeter have pre-
report upon the subject of houses let in tenements, which
time engaged their serious attention and that of the
l; and conclude by recommending that application be
Local Government Board to declare sect. 90 of the
Act to be in force within the district.

ry Local Board and Urban Sanitary Authority have
salary of Mr. J. A. Lawson, the clerk, from £75 to £90

ATION PAPER IN PLUMBING OF THE ND GUILDS OF LONDON INSTITUTE.

ing are the questions on the examination paper
mitted to the students at the Guild examina-

PLUMBERS' WORK.

Instructions.

de must confine himself to one grade only, the Ordinary
nd must state at the top of his paper of answers which
elected. He must *not* answer questions in more than

ready passed in this subject in the first class of the
e, he must select his questions from those of the Honours

of the question must be placed before the answer in
per.

allowed for this paper.

Ordinary Grade.

more than *twelve* questions to be answered.]

the principal physical qualities of lead.

a list of tools required by a plumber.

various kinds of traps, 'bell' traps, 'D' traps, 'S'
ps, and 'ball' traps. Sketch one of each, and say
ditions you would prefer the bell-trap.

as is called a pan-closet with its container, and with
-trap, and explain in full detail the disadvantages of
status.

5. Sketch a valve-closet apparatus, with syphon-trap, and explain
its advantages over a *pan*-closet with D-trap. Draw also any form of
(wash-out) closet with which you are acquainted.

6. Sketch a piece of soil-pipe with the best kind of joint in section,
and state how made. Would you use a wide-joint or a flange-
joint? Would you use a copper-bit or a blow-pipe? Which joint
would stand the longest, and prove strongest if tested by the usual
machinery?

7. A soil-pipe is usually four inches in diameter: what should be
the size of the ventilating continuation of such a pipe?

8. How does sewer air affect—(1) soldered lead soil-pipes, and
(2) drawn lead pipes, where there is no ventilating continuation of
the soil-pipe in either case? What is the proper weight for lead
soil-pipe per foot, superficial?

9. You may be frequently asked to lay down drain-pipes inside a
house, in a row of houses. With what material would you joint or
lute your pipes? What is the least fall in inches, which you would
give them in every 10 feet, and with what protective material would
you surround them?

10. Supposing you were laying down a 9-inch drain and found it
necessary to interpose a syphon-trap, what diameter of syphon would
you use? Sketch also the pattern which you would use. Do you
know any condition of things which would necessitate the use of a
syphon, with an upright in the centre of the hollow portion?

11. What is understood by 'disconnecting a house-drain from the
sewer?' Sketch the neces-ary apparatus according to any system
you know best.

12. What is meant by a 'box' gutter, and what are its disad-
vantages?

13. Sketch a hydraulic ram, and state its powers for lifting up water
with various sizes of pipes, and at varying distances.

14. Describe the several ways in which the wells of a house can be
contaminated, taking into consideration all the common waste of a
country house.

15. You have to deal with a house where there is only one cistern,
the service from which leads to sinks, baths, and lavatories and
closets alike. How would you disconnect the closets from the cis-
tern, and what would each disconnection cost? Sketch the cheapest
apparatus.

16. If you were asked to clean out a lead-lined cistern, explain
exactly how you would carry this out, and what you would make use
of for the purpose.

17. Sketch a wet-gas meter and a dry-gas meter, and describe the
action of each.

18. What are the chief disinfectants in use? Mention four of them,
and how you would apply them in various cases.

HONOURS GRADE.

[Not more than *fourteen* questions to be answered.]

1. Describe some of the principal chemical qualities of lead.

2. Describe the difference between red-lead and white-lead, and
explain how each is separately obtained. Describe also the uses to
which these two materials are usually put.

3. At what degree *Fahrenheit* does lead fuse, and what occurs in
castings of lead which are rapidly cooled? Can you imagine how the
sudden cooling of a leaden trap or soil-pipe could affect the health-
fulness of a building?

4. State, approximately, the cost of pig-lead per ton, and also the
weight of silver generally found in a ton of lead.

5. Describe all the various kinds of solder with which you are
acquainted, including plumbers' metal, tinman's fine solder and ordi-
nary hard spelter-solder; and state of what ingredients each is made,
and the relative cost.

6. How do different waters affect lead, zinc, iron, and tin.

Describe the difference between tinned lead-pipe and tin-encased
lead-pipe.

7. There is a certain chemical solution of a very common nature
which Dr. Christison said should always be put in a lead cistern for
a short time in order to cover the interior with an insoluble protective
film; what is this material?

8. By what formula would you compute the quantity of water pass-
ing through various sized pipes, from various distances, and from
various elevations or 'heads'?

9. Explain how the quantity of water flowing down a rivulet or
stream may be gauged with the view of ascertaining if it be sufficient
to supply a household.

10. What advantages do iron drain-pipes offer over glazed-earthen-
ware socketed-pipes?

Describe the method of making the joints in both, and give the
relative cost in each case, taking the earthenware-pipe to be laid on a
concrete bed and surrounded with three inches of concrete.

11. Draw (as nearly as possible to a uniform scale) a pan-closet, a
valve-closet, and any closet which is comprised in one piece of earth-
enware. State which you consider to be the most healthy for usage,
and why you prefer one and condemn the other.

12. It is supposed that the underground drains of a house are in a
leaky condition, and that the upright soil-pipes are also suspected;
what means would you take to test the soundness of both? Describe
the various means of dealing with both, and what materials you would
use, it being understood that any one entry would be allowed to be
made into the underground drain, and the foot only of the soil-pipes
exposed.

13. Setting aside the ordinary cesspool system, how would you pro-
pose to deal with the sewage of a small house with a quarter of an
acre of kitchen-garden, so as not to affect the health of the inmates?

Describe any systems of irrigation with which you are acquainted.

14. In an interior courtyard, with a number of windows in the
elevation, you have the option of erecting a soil-pipe in lead or iron,
which would you prefer—1, for cheapness; 2, for soundness—and
how would you make the joints in each case?

15. State the advantages or disadvantages of a soil-pipe fitted by way of a flinal with any cowl with which you are acquainted.

16. In the country it is very common to find houses, the inmates of which are obliged to rely entirely upon rain-water. How would you compute the quantity of rain-water available for their use, and what size of tank would it be necessary to provide with a given superficies of roof? As rain-water is very frequently impure, how would you filter it—1st, before it entered a cistern in the roof; and 2nd, before it entered an underground tank? Sketch any apparatus with which you are acquainted, which for a few minutes washes the impurities from the roof and delivers them into the common drain before delivering water into the drain leading to the rain-water tank.

17. Supposing that you were called to a house where an infectious disease had prevailed, and the house was vacated, how would you proceed to disinfect it, beginning with the basement and ending with the top storey; and what disinfectants would you use? What do the various disinfectants cost?

18. Sketch any illuminating-gas regulator with which you are acquainted and describe its action.

19. You are called to a house and you are asked to show that there is no escape of illuminating-gas; what steps would you take to satisfy yourself and your client as to the condition of the pipes, and on what indications, other than those of the sense of smell, would you rely in testing the soundness of the pipes?

NOTES AND QUERIES.

Having for some time back been in the receipt of Queries appertaining strictly to sanitary work, and which it would be easy to answer, without having to refer our correspondent to competent professional advisers, we have opened a column in which to register such Queries and Replies thereto as can fairly be expected from us; and our subscribers and readers are invited to make such use of this column as will tend to benefit themselves and the community. Both Queries and Replies will, however, be subjected, if unnecessarily long, to a strict curtailment.

126. LEGAL DEFINITION OF 'INFECTED' CLOTHING.

That part of the Public Health Act, 1875, relating to the exposure of infected persons and clothing, and generally in regard to infectious disease, has long been regarded as anomalous if not defective; and Mr. Harris, in a recent report on the health of Sunderland, draws attention to a question in relation thereto which we believe has never before been discussed. He asks whether the word 'clothing' in section 126 of the Act does not properly include the clothing worn by persons living in the same room or premises as the patient, and explains the circumstances which led him to bring the subject forward. It seems that up to October of last year he was enabled to keep in check, in the face of very defective hospital accommodation, the spread of small-pox by informing the members of the family of an infected person, who had no proper means for isolation at home, that it was essential for the public safety that they should elect to remain altogether in or out of the house, and that they could not be allowed to mingle indiscriminately with the public, while so virulent a disease as small-pox remained unisolated at home. It was explained to them that the members of the family when going to and from their work would, almost to a certainty, convey the infection to others, and they were also informed of the penalties attaching to an offence of this character. [Section 126 of the Public Health Act, as is well known, imposes a penalty of five pounds on any person who 'gives, lends, sells, transmits, or exposes, without previous disinfection, any bedding, clothing, rags, or other things which have been exposed to infection from any dangerous infectious disorder.' In October, Mr. Harris, considering that certain three persons had not proper means of isolation, informed the parents as above, and the patients were then removed to hospital at the request of the parents, who were given ample time to consider their course of action. Serious objection was taken to the health officer's procedure by the medical attendant, who complained to the Town Council. The Council appealed to the town clerk for an interpretation of the law, and he held that Section 126 of the Public Health Act did not apply to clothing worn by persons living in the same room or house. In consequence of this Mr. Harris had to cease his line of action, and was thus deprived of his most potent weapon for preventing the spread of the disease, which immediately made rapid strides.

[Viewed in a general sense, the town clerk's reading of the section is no doubt correct, for what is required to be proved is that the clothing has in fact been infected. It is doubtful whether the friends of a patient ill with infectious sickness can be required to stay at home; but on the other hand, there can be little question that the clothing of persons who are in close contact with those already attacked may become infected, although the difficulty of proving this would probably be a bar to successful proceedings for exposure. If, however, this can be satisfactorily shown, the section is, in our opinion, distinctly applicable. As Mr. Harris observes, there is no doubt that if any person carried into company, without previous disinfection, articles of wearing apparel which had been lying about, or hanging in, the infected room, that person would be subject to a heavy penalty; but, according to the local interpretation of the word 'clothing,' if the same person had lived in the midst of infection, and had afterwards mixed with the public, although dressed in the very clothing which he had worn in the sick room, then this person would not be liable to punishment. In

other words, clothing ceases to be clothing when it is so, this is so, the sooner the clause is amended the better, monstrous to think that nurses and other persons who employed, or who live in infected houses where there are 1 of isolation, should be allowed to wander about according own not sweet will without changing their wearing apparel escape punishment for spreading disease. As we have observed is applicable when evidence is forthcoming of the having been infected; but the wording can be obviously al the better.—Ed.]

127. COMPULSORY REMOVAL TO HOSPITAL.

Whilst upon the question of the imperfection of the clause Public Health Act with reference to infectious diseases, I well to direct attention to the need for amendment in the of Section 124 of the Act with regard to the powers of compulsory removal of patients. Under this section, Any person suffering from any dangerous infectious disease, and is lodging or accommodation, or lodged in a room occupied than one family, or is on board any ship or vessel, a certificate signed by a legally qualified medical practitioner removed by order of a justice to any infectious hospital w have been provided in the district. In the year 1879 the W. Corporation obtained powers under their local Act alternative procedure as to compulsory removal in such a way assistance of a justice's order is only to be called into re when the person to whom notice has been given requ removal of the sufferer to hospital definitely refuses to c such removal. The object of the clause is no doubt to p delay and difficulty which now often arise in obtaining a order for compulsory removal. It so happens that thi clause based upon the Warrington precedent found its the Burgh Police and Health (Scotland) Bill, a measure by the Lord Advocate to apply to all 'burghs' of more t inhabitants. At first sight the clause appears unobjectionabl but the medical officers of health of Glasgow, Greenock, a burgh, who have necessarily had much practical experience matter, unanimously condemned it as unworkable. Prob condemnation of it arose in part from the cordial agreem obtains in their districts between the health officers and t rates. This cordiality does not, unfortunately, exist throughout the country, and we not seldom read com health officers of the trouble and delay caused by the n obtaining a justice's order. The clause imposes an int stage before forcible removal is attempted, and so far its o laudable one. The objections to the clause appear to b chiefly from the fear that delay in removal will be caused It is, of course, highly important that when a sudden outl dangerous infectious disease arises, the very promptest should be taken for limiting the spread of the disease. T notices, however, contemplated by the section (which, no give it the appearance of delay) might apparently be mad difficulty to follow each other at the expiration of a few h there would certainly not be more delay in such a sy under the present system requiring a justice's order. other words in the 'Warrington' clause:—'without l accommodation proper for the treatment of the case, and for the purpose of isolation,' which make clear a point th much canvassed, viz.: whether the words 'proper lodgin accommodation' are intended to mean 'lodging and accom proper for the patient himself, or proper for those surrou Any improvement in the present unsatisfactory wordi general Act cannot but be regarded as an advan is worthy of note, in connection with this matter, t the Edinburgh Local Act the power of removal solely in the medical officer of health, who has responsibility, and there is no appeal from his decis public at Edinburgh appear to have acquiesced in t last twenty years, during which time the clause has wor public advantage. It may be necessary, however, for working of compulsory removal that the medical officer of sanitary inspector should have the power of forcing an e infectious disease exists or is suspected to exist, or the in the clause would be quite useless. This does not a provided for by the existing statute law. If the person of having disease or those in charge of him refuse admis medical officer of health it would frequently be impossi any certificate at all, and proceedings would thus be sto outset. It would be well, therefore, to give the medic health and sanitary inspector a power of entry, such a given in sect. 198 of the Greenock Police Act, 1877. I has, we are informed, been found at Greenock of th possible service in the prevention of the spread of diseas

128. CARPET-BEATING A NUISANCE.

The carpet-beating case reported in your columns of June vol. xiv., p. 606) is one of special interest to most sub dents. It is greatly to be regretted that the process invariably productive of annoyance, if not of actual injur cannot be restrained by the local authorities, and th aggrieved person the necessity of resorting to legal p Could not the difficulty be met on the part of the au means of by-laws, prohibiting the beating of carpets whole or any part of their districts? S

[It is very uncertain whether this can be effected, sin vious case the practice has been held to be only a public and not a public nuisance. Nevertheless, it is open to a authority to set apart a spare plot of land for the per this necessary operation, and to prescribe regulati management.—Ed.]

ORIGINAL PAPERS.

PARLIAMENTARY SESSION OF 1884.

For those who gauge the success or failure of the number of Acts that are added to the labours to what is euphemistically called the 'Book.' To such restless mortals the results of the present year will prove a disappointment; and we can well imagine the workman with a fine scorn at the modest quarto that contains the General Public Acts of the year 1884. There is abundant food for the contemplation of the set of volumes that are at large, without which no library that self considers its shelves complete. Compared with that 'bulwark of English liberty,' the *Statute Book*, which is always conspicuously displayed in the binding of Volume I., one's eye passes over the simple and uncomplicated measures of the legislative cravings of the Plantagenets, and Stuart periods. It is not until the reigns of the Georges that 'Acts' begin to fill the brain; but it is reserved for the nineteenth century to crush us utterly with Parliamentary legislation. One feels it necessary, indeed, to take a deep breath of the number of volumes added for the treasuring up of the many Acts to which her present Most Gracious Majesty has affixed her sign manual. Far be it from me to attempt the hopeless task of inquiring how far the tower of legislation has been beneficial, much better we all are for it. But without the length of the Earl of Wemyss and the effluence League, one may indulge in a little scepticism as to the usefulness and even the necessity of a good many of the measures that have received the Royal Assent.

THE METHODS OF LEGISLATION.

The legislative habit now-a-days is to be snippety. A difficulty crops up in the working of the law that can only be effectually remedied by further legislation. An enterprising member in this circumstance an opportunity of distinction. He introduces a Bill. The House is talked about; his name appears in the Government gazette; an evening for a pose he obligingly gives way, after promising that facilities shall be afforded for the consideration of the important measure he has taken charge; and in the fulness of time, may or may not—probably the latter—be his bantling safely through the shoals and of Parliamentary progress. In this way the less variations of important general Acts, the less the law and help to spoil its efficacy. As a very familiar instance, the Public Health Act of 1875 is currently regarded as our sanitary code. But it was tinkered at in 1876, again in 1878 as regards canal boats, again in 1879 as regards interments, again in 1880 as regards by-laws, again in 1883 as regards the law forbidding officers of local government to be concerned in contracts. And the same said of other branches of legislation. We have no time to take up a subject in and grapple intelligently with the problem it contains. We have never patience to construct an edifice upon one uniform plan:

we run up a flimsy erection of the 'jerry-building' order, and when its flaws become revealed we patch it up according to the fancy of the workman who happens to be nearest at hand. This is not as it should be; but to hope for better things is evidently futile whilst Parliamentary institutions endure in their present form.

PUBLIC ACTS OF THE LAST SESSION.

The impotence of the Legislature to perform its allotted task is, however, an oft-told tale, which no words of ours are likely to remedy. We pass, therefore, in accordance with our customary plan, to sketch briefly the measures that have passed the fiery ordeal of both Houses this session, and now add refugence to the majesty of English law. It requires some dexterity to discover any Bills that escaped the parricidal knife during the general massacre consequent on the fate of the Franchise Bill in the Lords; and of the few that have survived we are not sure that their sacrifice with the others would have been a source of unmixed grief. For with the solitary exception of the Canal Boats Bill, which really appears to be a useful measure, they all deal with some minute detail of sanitary procedure that was certainly not pressing, and would best have been dealt with as part of a general Act. It would be beyond our province to speculate how much more might have been done if the Franchise difficulty had not disturbed the calculations of those unhappy beings whose business it is to attempt to find time for everything, with the natural result of finding time for nothing. Subjoined is, however, the outcome from a medico-sanitary point of view of five months of the hardest work that members of the House of Commons have ever had to bemoan:—

Canal Boats Act (1877) Amendment Act (Royal Assent, Aug. 14).—The object of this Act is to remedy certain defects which had been observed in the working of the principal Act of 1877. Thus the registration of a boat under sect. 1 of the Act of 1877 having been found to be often a mere farce, and to have been regarded as covering a boat though reconstructed and altered, sect. 1 of the new Act provides that the certificate of registration shall cease to be of force in the event of any structural alterations having been made affecting the conditions upon which the certificate was obtained. The penalty clauses of the principal Act being imperfect, sect. 2 imposes a fine of twenty shillings on the master and owner of the boat for default in complying with any of the regulations of the Local Government Board and Education Department. No central control over the working of the Act by local authorities being provided for in the principal Act, registration, in the sense of control, of canal boats had come to be a dead letter in many parts of the kingdom. Accordingly sect. 3 enacts that 'it shall be the duty of every registration or sanitary authority within whose district any canal or any part of a canal is situate, to enforce within such district the provisions of the principal Act and this Act, and any regulations made thereunder by the Local Government Board.' Every such authority must, within the first twenty-one days of January in each year, make a report to the Local Government Board as to its proceedings during the preceding year for the enforcement of the law as to canal boats. Sect. 4 requires the Local Government Board to make an annual report to Parliament as to the execution of the Acts, and to cause inquiries to

be made from time to time by an inspector or inspectors to be appointed for the purpose. Such inspectors may hold formal inquiries, and call for witnesses and papers, and 'may enter any canal boat at any time by day (defined by sect. 9 to mean between 6 A.M. and 9 P.M.), and examine the same and every part thereof, and may, if need be, for the purpose of such inquiry, detain the boat, but for no longer time than is necessary.' The master must produce his certificate to the inspector, and furnish him with all the assistance he wants. Refusal to comply with the inspector's requisitions will be regarded as 'obstruction,' to be punishable by a fine of forty shillings. The Education Department may make regulations as to the attendance at school of canal-boat children (sect. 5), and are each year to report to Parliament how the Education Acts are enforced with respect to such children (sect. 6). In order to be 'lettered, marked, and numbered' in conformity with sect. 3 of the principal Act, a canal boat must be lettered, marked, and numbered on both sides, or in some suitable position on the stern of the boat, so as to be plainly visible from both sides of the canal.

Cholera, &c., Protection Act (Royal Assent, Aug. 14).—This is a short measure of two clauses, the *raison d'être* of which is not specially clear. It provides that where a sanitary authority in Ireland is empowered to acquire a site for a cholera or other hospital within its district, it may, with the sanction of the Local Government Board, exercise such power 'without, but contiguous to, such district' (sect. 1). Whenever the Irish Local Government Board directs any urban authority to superintend and see to the execution of regulations which otherwise would be the duty of any Board of Guardians, the sanitary authority may insert a separate item for the necessary expenditure in any rate required for the purpose (sect. 2).

The Cholera Hospitals (Ireland) Act (Royal Assent, Aug. 14) is virtually a re-enactment of the Act with the same title passed in the session of 1883. It provides that, on receiving a certificate from a medical officer that a case of cholera has occurred, it shall be lawful for the authorities of a sanitary district, having first obtained the consent of the Local Government Board, to take possession for a temporary hospital of any site within that sanitary district (sect. 1). It is to be sufficient notice to the owner or occupier to affix a notice on the walls of the union or any church or chapel in the district, or to post a copy of the notice to the occupier (sect. 2). No site is to be taken which is within 300 yards of a dwelling-house without the consent of the occupier (sect. 3); and not more than two acres may be taken for any site (sect. 5). The owner or occupier may be granted such compensation as the Local Government Board may award (sect. 4). The Act expires on May 1 next (sect. 7), and it is to be hoped that meanwhile some more practical legislation on the subject may have been inaugurated.

Disused Burial Grounds Act (Royal Assent, Aug. 14) forbids for the future the erection of 'any buildings upon a disused burial ground, except for the purpose of enlarging a church, chapel, meeting-house, or other places of worship.' This Act, which was promoted by Mr. Hollond, will put a stop to burial-grounds being disposed of in the future as eligible building sites, as was recently the case at Bethnal Green.

Public Health (Confirmation of By-laws) Act

(Royal Assent, May 18).—This is a pure Act with regard to the confirmation of made under various Acts of 1847 as to houses, hackney carriages, bathing, and m

The Public Health (Ireland) Districts A Assent, Aug. 14) makes provision as to tl over of the district, property, debts, and th any urban sanitary district in Ireland tha solved or for any cause ceases to exist.

The Public Health (Members and Offi (Royal Assent, Aug. 14), provides that pr for the recovery of any penalty under Secti the Public Health Act of 1875 from officers authority interested in any bargains made authority, shall not be taken except with th in writing of the Attorney-General.

The Valuation (Metropolis) Amendment A Assent, March 28), gives greater facilities f against the valuation lists in the case of w pay the tenants' rates and taxes, more e when the houses are subdivided into t separately rated.

We have no space to do more than me names of the other public Bills of the ses failed to secure Her Majesty's autograph. Mr. Waugh's *Copyhold Enfranchisement* i Cameron's *Disposal of the Dead Bill*, w voked an interesting discussion on cremat its second reading was negatived on April Monckton's well-intentioned but impracticab *ing House Inspection Bill*; Sir John Lubbo for extending the provisions of the Factor shops; the triad of measures introduced Broadhurst, Lord Randolph Churchill, : Charles Ross to put a stop to the iniquitous of life leases, on which we commented at the SANITARY RECORD for April 15 last; vernment *Medical Acts Amendment Bill* useful piece of legislation, which for two has been paralysed by the selfishness of th medical corporations; Mr. Cowen's *Municip Bill*; Mr. Warton's *Patent Medicines Bill*, r on March 26, in view of a promise by the ment—never fulfilled—that they would in measure of their own; Mr. Dodd's *Publi Acts Amendment Bill*; the Government creating a Secretary of State for Scotl: would have taken over, amongst other th control of poor law, lunacy, public health, tion, rivers pollution, adulteration, artisan ings, and other business of Scotland; Mr. ' absurd *Shop Hours Regulation (Liverpo* which proposed to shut up every shop in I except milkshops, tobacconists, refreshmen and druggists for the whole of Sunday, : 8 P.M. every day, except Saturday, when t to be shut at 2 P.M., under a penalty of 1c Stratheden and Campbell's *Smoke Nuisan ment Bill*; Mr. Peter Taylor's Bill for the the compulsory clauses of the Vaccinatio Mr. Reid's *Vivisection Prohibition Bill*; Dodd's and Mr. Henderson's *Waterwork Bills*.

UNSUCCESSFUL PUBLIC BILLS

WITH this paltry result ends a session whi more hopefully than any of its immediate sors in the promise of some efficient legis the subject of public health. For, inde; altogether of Sir William Harcourt's oft-t London Government Bill, there was a du

early in the session of a measure to reform the bottom local government generally; and the action of London, threatened with disestablishment themselves, had prepared a highly popular measure to pare the claws of the metropolitan water rates. These three measures all came to an early end. The first did not even reach its second reading, though its advocates profess to be a majority of 188 to 117 on a motion for adjournment as pledging the House of Commons to the principle of the Bill. The second never saw the light and the third was thrown out (admittedly not on its merits) by a majority whose common-sense was borne by the cry of confiscation. Nor must we mention the Lord Advocate's Bill for the amendment of the Police and Sanitary Law of 1855: a measure equally remarkable for its size, position, and its inherent absurdity.

London Government Bill was the first of two measures for the reform of local government introduced in the Queen's Speech and in subsequent declarations of Ministers. Whilst Sir William Harcourt professed his inability to deal with certain reforms in the administration of the metropolis, on the plea that this would properly form the duties of the new Central Council that was to be created by his Bill, Sir Charles Dilke was in favour of the consideration of State subventions to the metropolis by the promise of a Bill which would alter the whole constitution of local authorities.

The latter measure never got further than Sir Charles Dilke's tantalising sketch of it; but the Secretary's Bill, after three years of gestation, was brought forth to a dazzled community on 11th March. Sir William Harcourt proposed to incorporate as a single municipality all the inhabitants of the metropolitan area as defined by the Act of 1855, to transfer to the new municipal body all the rights, property, and obligations belonging to the Corporation, the Commissioners of Sewers, the Mayor, the Court of Aldermen, the Common Council, the Wardmote, the Metropolitan Board of Works, the magistrates of Middlesex, Kent, and within the specified limits, the Burial Boards, Vestries. Only three points were reserved: law administration, elementary education, and police. The Common Council, containing representatives for the City and 38 other existing parishes, was to be permitted to delegate its minor powers to local elected Boards; the Lord Mayor and Deputy Mayor were to be paid officials; the Corporation were to disappear.

During the fire for some little time, meetings for and against the Bill were organised in the City of London, and there is unfortunately no possibility for doubt that many, if not most, of the meetings were packed. But apart altogether from the noisy knot of agitators who exercised their lungs at these gatherings, there is an undercurrent of feeling amongst the more intelligent classes of the community that some reform of London Government is urgently called for. These classes now to bestir themselves, and inform the Cabinet that the question is one that should be regarded as urgent. The people who have up to now sent raised their voices in favour of reform do not adequately represent those who are anxious for change, but in London it is of all things most difficult to get the better and more intelligent classes to take an interest in local affairs.

Home Secretary's Bill was not perfection,

but it contained the elements of a good working measure, and nothing can well be worse than our present system of vestry mismanagement. The debate on the second reading of the Home Secretary's Bill brought out very remarkably the weakness of the case against it. Nearly all the antagonistic speeches belonged more properly to the Committee stage, which the Bill was never destined to reach. Not even the Lord Mayor, despite his picturesque determination earlier in the year to 'fight the Bill line by line,' had anything effective to say against the Bill: and there can be little doubt that had it been possible to get the verdict of the lobbies upon the Bill, its principle would have been affirmed by a substantial majority. It is idle to speculate as to the extent of its mutilation in Committee. The measure afforded a fair target for the attacks of a practically unlimited number of members ambitious of distinction, for local government is just one of those things upon which every man regards himself as a superior authority. We can only hope that the Bill may be reintroduced next year at a very early date, and promptly referred to one of the Grand Committees who had so easy a time of it last session. But with the shadow of the Redistribution Bill upon us it would be unwise to speculate very hopefully upon the chances of any useful legislation of this kind next year.

The *Burgh Police and Health (Scotland) Bill* was a very extensive and pretentious Bill introduced by the Lord-Advocate, apparently under the auspices of an obscure organisation known as the Royal Convention of Scottish Burghs. The Bill was of the paste-pot and scissors order, and had evidently been drafted by someone who did not in the least understand the subject on which he was working. The original draft of the Bill when first introduced in 1883 was received in Scotland with a shout of derision, some faint echoes of which were wafted south of the Tweed; and, although in the interval certain of the more flagrant absurdities had been expunged, the Bill in its revised shape of 1884 was still a masterpiece of bungledom. Although not so irrepressible and troublesome as their Irish brethren, Scotch members have a quiet persistent way of their own which enables them to get in fact, if not in word, a very workable Home Rule of their own, so that English members seldom care to interfere with whatever Northern legislators regard as helpful to their division of the kingdom. Moreover, the very bulk of the Bill itself—it weighed nearly two pounds and a quarter avoirdupois, and consisted of 558 clauses—was enough to deter any but the most voracious of amendment-movers from grappling with it. So the Lord-Advocate, anxious to see something passed, got a tired House one night to assent to the second reading, on the plea that it would be thoroughly considered by a representative Select Committee. Accordingly, a Committee was appointed. It consisted almost exclusively of Scotch members, of whom it is no disparagement to say that few have yet earned Parliamentary laurels. Undeterred by the heat of the weather, the Committee pressed gallantly through the 238 pages of the Bill, and knocked off its 558 clauses in seven sittings. Vainly were they told by the Parliamentary Bills Committee of the British Medical Association that the Bill contained clauses providing for the compulsory notification of infectious disease throughout Scotland by medical men—a requirement concerning which the profession had

a fair right to be heard; that many of the clauses of the Bill were unnecessary in view of existing legislation; that other clauses—taken hap-hazard from local bills—were senseless when divorced from their surroundings; that others again were duplicates couched in slightly varying language; and that generally the Bill needed careful consideration in view of the evidence which was proffered with regard to it by experts and the leading sanitary authorities of Scotland. The Committee decided to deliberate in private, and refused to hear any evidence. They 'revised' the Bill, and took out some of its grosser absurdities; but left it on the whole a more objectionable measure than before. They made the appointment of sanitary officers an annual one; they dispensed with any notification of disease by the occupier, and cast the entire burden upon the medical man, who, 'provided his diagnosis was found by the medical officer to be correct,' was to get half-a-crown for his certificate. It was felt to be necessary that some vigorous effort should be made to stop legislation of this sort; and accordingly the Parliamentary Bills Committee of the British Medical Association took measures for enlightening the House generally as to the character of the measure. The Lord Advocate pressed the Bill forward to the utmost of his power; but though he was successful in getting it reached one night, he had two days after to announce the impossibility of proceeding with it, in view of the opposition which it had excited. An amended consolidated Public Health Act for Scotland appears to be much needed, as the last general Act on the subject was passed in 1867; but it is to be hoped that in preparing it the Lord Advocate will turn a deaf ear to the syren voice of the Royal Convention of Scottish Burghs.

In the *Metropolis Water Bill* there was a certain element of amusement, for the City Fathers, whilst protesting with all their might against any meddling interference with their own vested rights, were posing as the people's champions in promoting legislation of the most confiscatory sort against the water companies. Not that the last-named organisations would have deserved any sympathy if the Corporation proposals had been carried into effect. Far from it. It would be a pity if their interesting pavilion at the International Health Exhibition, and the beauty of the fountain displays for which they provide the funds, were to blind the public to the extremely selfish and narrow-minded way in which they have administered the monopoly which the foolishness of Parliament in the past has given into their hands. The City Bill proposed simply that a consumer might require a supply of water for domestic purposes to be furnished to him by measure; but the charge by measure was only to come into force after a certain quantity—sufficient for ordinary requirements—had passed through the meter. But it also proposed (and here was the rub) that all new shares or stock of the companies should be offered by auction or tender; thus putting a stop to the quiet allotments at par of shares that are immediately entitled to a dividend of 10 per cent. or more, for which it is needless to say, the unhappy householder has to find the funds. There was much cry when this Bill came up for second reading about the widow and the orphan, and solemn bargains with the companies, and the rest of the cant of 'confiscation.' In the end Mr. Octavius Coope, the chairman of one of the water companies, led a sympathetic and emotional

majority into the lobby, and the good intentions of the Corporation were thus brought to nought. The water companies have not, however, had an altogether rosy time of it during the session. Awkward questions have been asked as to their intakes and the sewage of the Lower Thames Valley; the leading journal has teemed with correspondence on the subject of water rates; the victorious Mr. Dobbs has been addressing public meetings in the vain hope of getting them to understand the technicalities of the case that he so gallantly took to the House of Lords; enterprising householders have worried the hard-worked police magistrates for interpretations of abstruse sections of Acts of Parliament, and generally the companies have had, always excepting the chorus of admiration of their South Kensington enterprise, hardly a dog's life of it.

Their adversaries in Parliament have given them no peace, for in both Houses Bills were presented with the object of settling the amount of the claim for water services which the law authorises the companies to make. The Earl of Camperdown made a spirited effort to get them to declare themselves; but, unfortunately, he was bowled over on the ground of non-compliance with those awe-inspiring mysteries known to the vulgar as the 'Standing Orders.' His Bill proposed that the water companies should send in either quarterly or half-yearly, to every person liable to the payment of water rates for domestic purposes, a claim or demand note, containing the particulars by which the sum total claimed is made out, including the annual value on which the percentage charge is levied; and that not until such claim had been delivered should payment by the consumer become due. No supply of water was, moreover, to be cut off unless the water company had obtained an order granted on a summons to show cause why the supply should not be cut off, such order to state when the cutting off may take place, as well as the reason for putting the power in force. Another Bill, introduced into the Commons by Mr. Torrens, Mr. Sclater Booth, and a number of metropolitan members, proposed to give legislative endorsement to the principle laid down as regards a single company in the Dobbs' case—viz., that 'the annual value of the tenement supplied with water in the 68th section of the Waterworks Clauses Act, 1847, should mean the "net annual value" to be settled from time to time by the local authority as duly constituted.' But this Bill, like many others, was sacrificed at the shrine of electoral reform.

PRIVATE LEGISLATION OF THE YEAR.

Notification of Infectious Disease.—The line of demarcation which separates public Bills from private ones is not seldom very difficult to define; and if a judgment may be formed from the legislative products of the last few years, we should be inclined to say that so-called private legislation is getting to be quite as important as, if not more important than, public legislation. It lacks, moreover, the safeguard of publicity that in a measure controls the latter, and as a consequence the mass of local variations of general statute law that have crept in under the cloak of private Bills has come to be simply appalling. It appears impossible to rouse the House of Commons to a sense of its responsibility in this matter. The hour of 'private business' is by universal consent voted a nuisance and a bore, and to serve on a Committee on a local Bill is

d as the most tiresome of the *disagreements* to the duties of a legislator. This is not to gird at the inefficiency of a chance conation of half a dozen country gentlemen to a lengthy and complicated private Bill upon its. Our present system of private Bill ion stands self-condemned. Owing chiefly exertions of Mr. Craig-Sellar, the House is ly awaking to a sense of its incapacity to th the intricate problems of the hundreds of Bills which the buoyant hopes of promoters annually to their notice. When Mr. Dodson that 'something must be done,' it is fair to that the leaven of Mr. Craig-Sellar is per- g the House, and that when it can find time her distractions it will make a beginning of g the Augean stable in its midst.

of course idle to expect that any set of men, r well-intentioned, will go deliberately out of y to give themselves more work. Hence, when mbers who found themselves upon the rota Talbot's Committee on Police and Sanitary tions came fairly to appreciate the work them, they naturally declined to vex them- about the theoretical objections to this or al proposal. They had referred to them all s (twelve in number) that contained powers to police and sanitary regulations which d from, or were in extension of, or repugnant general law. They sat thirty times, and were t heartily glad to finish and to endorse their n's draft report. Their governing idea seems been that you might propose what you liked ay of spending money so long as you paid ur loan in a given number of years, and that wanted further sanitary powers you must at Mr. Sclater Booth's Committee of 1882 n pleased to designate as permissible.

lon, Dewsbury, and Jarrow astutely repro- these clauses, and the Committee passed them ticism. Brighton at first wanted to have ury notification of infectious disease, but re- after a town's meeting in opposition at the . Lord Redesdale, through whose hands first went, declined to allow the clauses to nged; but Mr. Talbot's Committee was more sant, and struck them out with alacrity. same Committee at the previous sitting had lly obliged the good people of York to the entire series of Sclater-Boothian clauses, hey did not want, and which had found no e Bill as drafted and locally approved. ng to the best-received versions of this inary proceeding, a prominent member of mtee—much interested in the question of ion—asked the counsel for the York Bill . Sclater-Booth's clauses were not included easure, and was informed that they had not about it. To the same member's suggestion se clauses should be inserted, the counsel, aturally anxious to curry favour with the tee, effusively assented; and thus York finds lded, without its knowledge and without its to compulsory notification of infectious and the rest of it. It was too late to organise osition, as the Bill had passed its final ore the Committee's report on it was made . And this is the way we make laws in the lf of the nineteenth century.

the York proceedings fresh in their minds ey passed their general report, we hardly

see how the Committee can conscientiously say that they 'have not considered it their duty to impose upon the promoters of Bills' the model clauses of 1882. Nor can we, with the example of the Committee itself before us, find much hopefulness in their suggestion that another Select Committee should be appointed to consider whether there should not be a general Act amending and consolidating the laws relating to police and sanitary regulations. Some such inquiry is certainly needed, but a Royal Commission would be by far the best medium for collecting the information and sifting the evidence which is now at hand for the purpose. There is one paragraph of the Committee's report with which, however, we find ourselves able very thoroughly to agree. They say: 'It is obvious that these are matters of the highest moment to the rapidly-growing communities whose wants are every year pressed upon Parliament; and whilst recommending the consideration of these subjects in a general manner, the Committee would strongly advise that, pending the enacting of such a measure, care should be taken in succeeding sessions to control the attempts which local bodies not un- naturally make to arm themselves with powers which the law has not yet sanctioned.'

The net result of the Committee's labours, so far as concerns the compulsory notification of infectious cases and the other clauses that follow in its train, is that at three fresh towns concurrent notification by the occupier and by the medical man may now be put in force. These towns are Croydon, Dewsbury, and York. Brighton might have made a fourth, but withdrew at the last moment.

Open Spaces.—A good many of the railway and other Bills of the year contained as usual clauses for swallowing up without adequate compensation bits of commons and waste land and other open spaces, the loss of which would one day, if not immediately, be bitterly deplored. Thanks to the energy of the Commons Preservation Society, the Metropolitan Boulevard and Playground Association, and kindred bodies, these things are better looked after now than they were a few years ago, and the first-named society, in its annual report recently issued, fairly takes credit to itself for snatching from the insatiable maw of the railroad monster common land and open spaces that would else have been assimilated without let or hindrance. Perhaps the Parks Railway Bill could hardly be properly regarded as an invasion of open spaces, though there were not wanting people who questioned the efficacy of the proposed system of ventilating the line, and prophesied that eventually the detested blowholes would have to be allowed in the parks. Mr. Boyce's well-intentioned Access to Mountains (Scotland) Bill did not reach a second reading, but a modest little measure, promoted locally, has effectively preserved the Malvern Hills from the encroachments that threatened to spoil their beauty as one of our national breathing-places. (See SANITARY RECORD for April 15 last.)

Salt Works and Cement Works.—It is not often that Provisional Order Bills excite the imagination, but two of the sixty-four Bills of this class—which afford profitable employment for the junior members of the Ministry—contained some points of interest. The one proposed to confirm the Provisional Order of the Local Government Board, dealing with the question of the sewerage of the Lower Thames Valley, and was thrown out by the Select Com-

mittee appointed to consider the subject. The other, passed on July 28, deals with the regulation of salt works and cement works, and confirms a Provisional Order made by the Local Government Board in this behalf on April 10 last. This Act provides that the owners of all salt works shall adopt the best practicable means for preventing the discharge into the atmosphere from the furnaces or chimneys of such works of the muriatic acid gas evolved in such works, or for rendering such gas harmless or inoffensive when discharged. Every salt work must be carried on in such manner that in each cubic foot of air, smoke, or chimney-gas escaping from the works into the atmosphere there shall not be contained more than one-fifth of a grain of muriatic acid gas. The owners of all cement works must adopt the best practicable means for preventing the discharge into the atmosphere from the furnaces or chimneys of such works of the noxious or offensive gases evolved from such works, or for rendering such gases harmless or inoffensive when discharged. The penalty for non-compliance with these regulations is, in the case of the first offence, 20*l.*, and in the case of every subsequent offence 50*l.*, with a further sum not exceeding 5*l.* a day.

PRACTICAL BENEVOLENCE.—Lady Goldsmid and Miss Montefiore have for the third time given special donations to the Women's Protective and Provident League for the hire of a seaside house, at which the members of the various Women's Unions, formed under the auspices of the League, can spend a holiday at small cost. The committee of the League have in consequence taken a furnished house at Brighton, within three minutes' walk of the sea, for seven weeks, from Aug. 9 to Sept. 27. The charges fixed for members of Unions are 3*s.* to 4*s.* a week for bedroom, use of sitting room, and attendance; to friends of members (women) 5*s.* and 6*s.* Visitors are expected to make their own arrangements as to board, which is easy enough in Brighton, where food of all kinds is abundant and reasonable in price. The value of change of air and scene to the hard-working sempstresses and workers at various trades who compose the Union cannot be overrated, and the beneficial effects of these agents are greatly enhanced by the comfort and privacy of such a temporary home, in contradistinction to the bustle and frequent want of cleanliness and order met with in low-priced lodgings at the seaside. The unobtrusive and womanly kindness of Lady Goldsmid and Miss Montefiore are worthy of all praise, and are a delightful illustration of the grand precept, 'Do as ye would be done by.' An excellent sanitary agent in the shape of a Swimming Club has also been established by this Women's League, and is very well attended and greatly appreciated by the members of the Unions. The club meets at the Whitfield Street Baths, Tottenham Court Road, the admission to which, by special arrangement, is twopence. Six swimming lessons may be obtained for 3*s.*, and at the end of the season a competition takes place for prizes given by friends of this excellent little society, which is quietly sowing good seed in a variety of directions, moral, social, and sanitary.

The New York City Board of Health has adopted an ordinance forbidding the use of any tap, faucet, tank, fountain, or vessel, or any pipe or conduit in connection therewith, for storing beverages for drinking, which shall be composed of or made with brass, lead, copper, or other metal or metallic substance that is or will be affected by liquids so that dangerous, unwholesome, or deleterious compounds are formed therein or thereby, or such that beer, soda-water, syrups, or other liquid, or any other beverage, drink, or flavouring material drawn therefrom shall be unwholesome, dangerous, or detrimental to health.

SANITATION AT THE N ADMIRALTY AND WAR OF

By HENRY M. MAVOR.

IN looking through the various competitions for these important buildings, now at 18 Spring Gardens, it will be noticed that sanitary arrangements have in some cases received more preliminary attention than has been bestowed in many former cases. It is hitherto only too general to leave the sanitary arrangements to the last moment, and to call in a sanitary expert at the eleventh hour, who then is fain to suggest structural alterations to enable the main points to be adopted. These alterations, though great in themselves, are to a certain extent often the cause of vexatious delay, which might have been avoided if due thought had been given in the first place. This, however, is happily a thing of the past, and the sanitary arrangements of public buildings now erected where they are not made by the architect for the building, and the elaboration of the entire scheme of ventilation. Modifications, as the work proceeds, may be made to suit the special circumstances arising; but, on the whole, it may be said that a successful result is obtained by the short-cut means. In the example before us the sanitary arrangements have received considerable attention at the hands of the designers of the building, and, subject to any necessary modification, it will be seen that the principles have been recognised, and will be carried out in operation throughout.

As regards the heating and ventilation, the corridors on each floor will have a space of 18 in. or more in depth between the floor and the ceiling, in which the steam pipes will be carried. Near the ceiling will be an engine-room with fan chamber, in which air being introduced through gratings, will be blown by four powerful fans capable of circulating the air twice in the hour all over the building. Purified cold air will then be carried down the channels before mentioned, where it will be heated by being driven over the hot pipes. These channels flues of calculated area will be carried to the rooms and corridors, having openings both at the floor and ceiling for winter and summer ventilation. There will be openings to the room from these flues, with adjustable valves to regulate the admission of air. By these means all the rooms will have air forced into them by the fans, and as a consequence the vitiated air will be drawn up the smoke flues (the draught of which will be maintained thereby) and also up the foul-air shafts. The latter will have regulating valves with shutters or flaps to prevent any back draught; the inlet openings will be greater than that of the outlet, so that the amount of air may be increased at will.

The foul-air shafts will communicate with the trunks in the attics, these trunks will in turn deliver into foul-air chambers, centrally placed in each of these foul-air chambers power ventilators will be connected, and as the air is driven into the rooms, the foul air will be drawn up by displacement, assisted by the air-pump and upcast foul-air shafts.

The lavatories and water-closets will a

to the north or east, so that the sun may not be on the soil-pipes; these soil-pipes will be in chases formed in the outside of the walls to equable temperature, and will be ventilated throughout their length, the system adopted being 'combination' type, having mica valve inlets and outlets, the latter delivering above the roof, and away from any of the attic dormer windows.

The type of water-closet apparatus will be on the principle, and all the traps will be ventilated. Lavatories will be simple in construction, having discharge valves, and marble or slate tops, and will be trapped and ventilated to prevent syphoning. The waste-pipes will be carried inside the building (to prevent freezing); but will be vented throughout their length, delivering into discharging traps at foot, and communicating with the atmosphere above the roof level. The urinals on the lipped cradle principle, with self-acting mechanism for flushing purposes, the wastes being separate from any other part of the system, and coming down in the same chases in the outside of the walls, as those provided for the soil-pipes. The wastes will also be ventilated and disconnected from the drains, in a similar manner to that adopted for the lavatory wastes.

The housemaids' closets will be fitted with instantaneous water-heaters, due precaution being taken against risk of fire, and means provided for carrying off the products of combustion. The water-supply system will be treated on principles before de-

scribed. The lavatory room, walls, and ceilings will be of glazed bricks, and the floor tiled, so that the whole can be washed readily. Ventilation of these particular places will require special attention. Each series of rooms being one story, the authors have arranged that each shall have an extract ventilation shaft delivering the foul-air chambers in the roof, the exit of foul air being further facilitated by extraction. Fresh air will be supplied direct from the street, though probably in winter it may be advisable to pass the air over disconnectable coils of pipes to prevent the effects of frost.

The system of proposed drainage is based upon the principle that all drains without exception should be separated, having inlet and outlet for air, and disconnected from the sewer, the rain-water, soil, and gas pipes also being disconnected from the drain, the connecting traps likewise being ventilated. As indicated on the plan, each series of soil-drains will be flushed twice a day by automatic flushing arrangements.

Rains passing through the building will be of iron, treated with the Bower-Barff process (for prevention of rust), the joints being leaded.

A question which has given rise to a certain amount of controversy is that of direct external ventilation to a considerable portion of the building, as first mentioned by Mr. George Godwin, senior editor of the *Builder*, in a letter to the *Sanitary Record* in which he says, 'I am impelled to trouble you with a few lines on one most important part of the plan—I allude, of course, to the arrangement of windings around a closed central court about 100 feet long and 80 feet wide. Your own criticisms of other journals have already pointed out the comparative narrowness of this court, and the serious character of this arrangement has

not been dwelt on. I have no hesitation in saying that if this proposed plan be carried out, the building will be a most unhealthy one, to use the mildest term. The court during a large number of days in the year will be a tank of stagnant air, and no arrangement for separately ventilating the numerous apartments around it will suffice to prevent the evil it will do. The health of the majority of the occupants, day after day, of the various apartments will be gradually deteriorated, and the weakly will die off.'

None can gainsay Mr. Godwin's great experience in such matters; but, also to use the mildest term, we venture to say this is an extreme view. In the first place, the angle of 45° reaches the lowest window, and the angle of 60°, at which the direct rays of light enter, is well into the court; so much for 'light,' which goes hand in hand with 'natural ventilation.' In the same letter it states, 'every new street shall, unless the Metropolitan Board of Works otherwise consent in writing, have, at the least, two entrances of the full width of such street, and shall be open from the ground upward. Yet here we are to have what is tantamount to a new street, surrounded by exceptionally high buildings, closed not alone at one end, but at both ends, under Imperial sanction.'

Here we appear to have the gist of the matter, as this court or street is not closed at each end, but two large open gateways are necessarily required and shown on the ground plan. These openings will serve as inlets to create a considerable draught of air to prevent the 'stagnation in the tank,' and instances of the disagreeable strength of such a draught are by no means wanting. This would then appear to meet the further statements that 'the laws of nature do not change' and 'no opinion will affect the laws which regulate the movement of air.' These considerations have probably not escaped the notice of the examining committee, in which it must be remembered are two architects not unknown to fame. It has also been suggested that the height of these archways should be increased by an open columnar arrangement above them, and although this would entail a slight loss of space, it would have the effect of 'making assurance doubly sure,' and certainly not detract from the architectural appearance of the *façade*.

In questions of this description it is always well to 'err on the side of precaution,' and Mr. Godwin has done well to enter a protest against undue fulfilment of conditions which are for all time, and to bring discussion to bear upon the subject of prevention instead of cure, but it is by no means hazardous to venture an opinion that in this, as in other respects, profiting by past experience, and taking the exigencies of the site into consideration, the sanitary conditions will be met satisfactorily.

The last new thing in advertising is said to be a paper pad shirt. The bosom of this peculiar form of cheap garment consists of seven layers, of which one can be removed every day, on the blotting-pad principle, exposing a clean white surface in its place. It is further proposed to print instalments of a sensational novel of thrilling interest on the back of each of the layers, in the hope, probably, that after once beginning the tale, the wearer of the paper-pad shirt will be tempted to peel off the successive layers of his shirt-front in order to reach the dénouement of a tantalising plot! It is not stated whether this is an American invention, but probably it is so, from beginning to end.

THE POLLUTION OF THE RIVER LEE.

AT this dull season of the year, the censorship of editors of the daily newspapers over the letters admitted to their columns is apt to get somewhat relaxed. Hence the public has been confused, and not a little startled, at certain descriptions in the *Times* of the insanitary state of the River Lee, which may well lead the average reader to the belief that all the conditions but one for a very promising outbreak of cholera, exist in the water taken from that stream for domestic use by a large section of the population of London. We can easily imagine a drinker of East London or New River water conjuring up the most frightful fancies as to the morbid qualities of that liquid after a perusal of his morning's paper, and even the happier mortal whose cistern is furnished from the pellucid Thames, may well have felt a thrill of sympathetic horror. Now the Lee is fortunate amongst rivers in having a sanitary engineer (Major Lamorock Flower) devoted to the preservation of its virtue. This gentleman perambulates its watershed perpetually, knows every little ditch that is dignified by the name of tributary to it, and generally devotes his best energies to keeping it as pure as possible. And Major Flower's opinion evidently is that, with one exception, to be presently referred to, there is no ground for the allegation that the Lee is polluted by sewage above the intakes of the two companies which draw their supply from it. The fact is that the complainants in the *Times* have confused the issue by writing as though the admitted and flagrant pollution of the lower reaches of the river was a danger to the water supply of a considerable part of London. This is from the nature of things impossible; and in what follows we shall attempt to separate the two things as far as possible from one another.

I. First, then, as to the Lee in its potable relations with the community. A full third of the water supply of the metropolis is derived from the Lee. The New River Company takes about twenty million gallons a day from it, and the East London Company about thirty-two million gallons. The Lee Conservancy Board have powers not only, as in the case of the Thames Conservancy Board, over a strip of land ten miles wide on either bank of the river, but over the entire watershed, which extends over something like 600 square miles. Under the powers of the Lee Conservancy Act 1868, it is unlawful to open any sewer into the Lee or any of its tributaries; to suffer any sewage to flow into the Lee or tributaries through any sewer; to open any sewer into any ditch or channel communicating with the Lee or tributaries; or to suffer sewage to flow into any such ditch or channel. The penalty for infraction of this regulation is 100*l.*, and 50*l.* a day afterwards. To place any manure heap, or collection of offensive or injurious matter, so that it can drain into the Lee or tributaries, is punishable by a fine of 10*l.*, and 5*l.* a day afterwards. And to throw into the Lee or tributaries any dead animal, filth, or other noisome thing, or wash or cleanse therein any animal, cloth, wool, leather, or skin whatsoever, is punishable by a fine of 5*l.*

If worked at all conscientiously, and there is abundant evidence of Major Flower's energy in getting nuisances abated, these stringent prohibitions ought to effectually purify the river. But this same Act of 1868 is unfortunately hampered by exemptions which the Conservancy Board are power-

less to alter, and which have given them abundant trouble. Thus Luton, with a population of 20,000, is specially permitted by sect. 101 of the Act of 1868 to discharge the effluent from its sewage works into the Lee after the sewage has been subjected to certain chemical processes. To the credit of the Luton authorities, however, it should be stated that the clarified effluent of the chemical process is passed over land previous to the discharge of effluent into the Lee, and pollution from the town is thereby abated. A recent analysis by the consulting chemist of the Lee Conservancy Board of the water of the river above Ware Lock may usefully be subjoined. Against it has been placed for comparison an analysis of East London water from the company's main at White Horse Street, Stepney, collected on the same day in last January:—

	Ware Lock.	Grains per gallon. Stepney.
Solid matter	25.9	24.5
Loss on incineration	2.8	2.1
Ammonia.....	.0021	.0021
Ammonia from organic matter...	.0042	.0042
Chlorine	1.4	1.435
Nitrates	Trace	None
Phosphoric acid	None	None

Both samples are described as clear and inodorous, and there is evidently nothing to choose between them.

But the chief danger to the purity of the Lee water is derived from the sewage effluents at Hertford. Hertford disposes of the sewage of its 7,500 inhabitants by precipitation, and, like Luton, it has a special clause in the Act of 1868 permitting it to discharge the effluent into the Lee under certain conditions. These conditions the Conservancy Board considered had been infringed, and accordingly they entered an action against the Corporation. This trial came on not long ago before the late Mr. Justice Watkin Williams, and provoked during the fourteen days that it lasted the usual conflicting evidence from so-called 'experts.' In the end the Conservancy Board were defeated, and the Corporation now pour their effluent unresisted into the river. It may be as well to quote here, as there has lately been question about it, the decision of the judge who tried the case:

'1. I find, first, that so long as the Corporation of Hertford thoroughly and efficiently subject the Hertford sewage to the best practical process of purification they are not liable to an action for discharging the effluent into the river at the authorised place.

'2. I find that the Corporation have treated the sewage, and are still treating it, thoroughly, according to the best practical process.

'3. I find that the accumulation of mud in the Lee below Ware is in no way caused by the Hertford sewage.

'4. I find that no real injury, pollution, or nuisance has been caused by the Corporation to the waters of the Lee.

'It seems to me, therefore, upon those conclusions, that this action ought to be dismissed, and dismissed with costs.'

The clause upon which the Corporation rely for their exemption from the penalties which would otherwise attach to their pollution of the river was originally obtained by them thirty years ago, when sewage disposal was in its infancy; and in the interests of the water companies and the public health it ought clearly to be repealed. To those who

ous of ascertaining in detail the freedom of reaches of the Lee from serious pollution, commend a perusal of a valuable report by Flower, printed in the official report of the aminer of the metropolis for the month of . Major Flower goes minutely into the circes of each town on the banks, not only of but also of its tributaries—the Mimram, ne, Quin, Ash, Stort, and Cobbin's Brook ; a mental reservation as to Hertford, he t the conclusion that on the whole the upper s secure from dangerous pollution as could expected in a river so circumstanced.

at it is far different below the intakes of the ompanies, and Major Flower himself admits ent animadversions on the state of the river nham and thereabouts are only too true. t is that the enormous increase in the popu f Tottenham has not been followed by an e increase in the tank-room and appliances ewage works. Hence a large volume of eated sewage passes daily from the works Lee, and besides this there is a frequent e of crude sewage into the dock, which is le the sewage works, and which is 'a seeth- s of putrefaction.' The Moselle brook, ns through Tottenham, also receives pollu- m the population through which it passes. s no need to waste words in describing the affairs at Tottenham. The facts are prac- dmitted on all hands. The water is little han sewage; the banks are covered by : mud, and exhale pestilential odours; boat- bathing have alike been rendered difficult, npossible.

Local Board have been stirred up on the in a number of ways. Under the Act of 1868 referred to, the Local Board of Health have de certain tanks and filter beds, and thereby, : best known practicable means, to purify and t the sewage matter passing through the said and, as long as the purification and disin- are effected to the satisfaction of the Con- y Board or the Secretary of State for the Department, nothing in the Act authorises :servancy Board to give to the Local Board : requiring them to discontinue the discharge :ffluent water remaining after such purifica- o the Lee through the outfall provided for pose.

since 1868 the conservators of the Lee have essing the Local Board on the question, and enlargement; and improvements at the works have taken place. In 1875, the river ery much polluted, the conservators referred utter to the Home Secretary, who gave a a in favour of the Local Board. After con- complaints since then, the matter was again l to the Home Secretary, and a public inquiry . Arnold Taylor, of the Local Government was held in January last, following which a f observations and analyses were made. On the Conservancy received the decision, which verse to the Local Board. The notice was last July, and until the expiration of twelve : from that time legal proceedings cannot be y the conservators.

Hackney District Board of Works have also p the cudgels, though their recent memorial Local Government Board is singularly mis-

leading and inaccurate. They begged the Central Board to cause an immediate inquiry to be made, with a view to taking steps for requiring the abatement of the nuisance. This memorial was forwarded for observations to the Tottenham Local Board, and their reply may be taken to contain all they have to say in their own defence. They reply that they are pushing forward the construction of new works at their sewage out-fall, which, either alone or with some addition, will certainly, when completed, remove all reasonable ground for complaint, so far as the Tottenham district was concerned. Except after heavy rain, no overflow is allowed to pass into the River Lee. The completion of the new 100 horse-power pumping engine will, the Board are assured, enable them to deal even with the storm water. The Local Board consider that the combined conditions of the reduced flow of water into the river, and the high tempera- ture, which have operated so prejudicially in con- nection with the sewage outfalls into the Thames during the present summer, must not be left out of consideration in connection with the present state of the River Lee. The experience of twenty years has shown that such results are only possible under such combined adverse conditions, and that they only occur at distant intervals, and prevailed but a short time. The Board have evidence to show that for the past six or seven weeks there has not been sufficient rainfall to require exceptional treatment of the sewage delivered at their works. They are using, and will continue to use, as long as it may be necessary, means for disinfecting and deodorising the dock and the stream passing through it into the River Lee at their sewage works, and have given instructions for the immediate dredging of the dock. Further, they have directed their engineer to prepare and submit a plan and estimate for the construction of a reservoir of sufficient capacity to hold at least a day's volume of sewage preliminary to other works in contemplation.

It is to be hoped that, the matter having now attracted general attention, the Local Board will be kept strictly to their promises, as the present state of the river thereabouts is scandalous to all concerned. But there are other authorities besides Tottenham, such as Walthamstow, Leyton, and West Ham, which discharge their sewage in a more or less purified condition into the Lee, before it reaches the Thames and adds to its foulness. Looking to the growth of these places, and to the strong probability that before long measures will have to be compulsorily adopted for the general purification of the Lee, the plan already designed by Sir Joseph Bazalgette and Major Flower, and Messrs. Law and Chatterton, for an intercepting sewer to take all the sewage of the districts referred to, straight into the Thames below Barking after treatment appears to merit renewed consideration. The scheme seems an ambitious and at first sight an extravagant one; but Major Flower calculates that not more than a sevenpenny rate would be required for the purpose; and that if the expenses saved in pumping and administration of sewage farms be deducted, probably a sixpenny rate would be sufficient. Evidently something must be done, and that without delay.

A PAPER has this advertisement: 'Two sisters want washing.' *Pace* Mr. Edwin Chadwick, thousands of brothers are in the same predicament.

THE PRIMARY PRINCIPLES OF THE SANITARY HOUSE AT THE HEALTH EXHIBITION.

By JOHN F. J. SYKES, B.Sc. (Public Health), M.B.,

Member of Council of the Sanitary Institute.

THE specially selected committee is to be congratulated on the success attending the erection at the International Health Exhibition of two houses, side by side, the one with all its sanitary requirements perfect and the other with all the points of its sanitary armour defective; a suggestion, due to one of its members, Mr. H. H. Collins, which affords an opportunity for the first time of a complete survey of scattered sanitary maxims gathered up and presented as a collective construction.

The numerous appliances in use will doubtless be a source of warning and instruction to householders, and an example to house-builders. But it has been intimated that the approved sanitary appliances which are used are only a few of the many, and these few are not to be considered as of more value than the many of the same class and type. It would therefore be invidious to dwell on them in detail. But if this novel experiment result in definite principles being laid bare to be grasped by those who make our houses, we shall have reached a landing stage in sanitary science long sought for and slowly attained. The methods by which our houses can be rendered obnoxious are so numerous that great credit must be given to the gentlemen who have so ably chosen the typical faults wherewith to build up an insanitary house. Even these are but a tithe of the means employed for inviting dampness, accumulating soakage, collecting dirt, excluding light, preventing ventilation, poisoning the air, polluting the water, laying on sewer gas, and providing other ready means of access to disease. Having no guiding principles they are beyond comprehension, and as for description they are so beautifully contrived and annotated that they must be seen to be appreciated, when they themselves will be sufficiently eloquent in their silence.

In the sanitary house on the other hand we find the corresponding remedies. Dryness provided for by damp-proof courses, concreted basement and ventilation under floors. Cleanliness by the polish and construction of the floorings. Light and air by ample and adjustable windows, each water-closet ventilating independently of the passage by its own full-sized window. Soakage, accumulation and sewer-gas kept at bay by a proper system of draining and ventilation, notably by an iron gas-tight house-drain.

Passing from the points of construction let us endeavour to analyse and grasp as a whole the systems and methods adopted of—

1. Refuse removal.
 - a. Liquid.
 - b. Solid.
2. Water supply.
3. Ventilation, warming and lighting.

The drainage comes prominently first, and demands the fullest consideration. It will be most convenient to proceed from below upwards. There being no sewer, the means of sewer ventilation in connection with the house is not illustrated, probably as being still *sub judice*.

The sewer connection terminates in the forecourt by an S trap cutting off air connection with the

house and precincts. The house-drain discharges into the S trap through an open conduit running under a manhole. To this air is admitted by a tube or a grating in the wall of what would be the forecourt. The long inlet tube, sometimes seen running high as the roof, to avoid the unpleasant and possible reflux of air, is here on good authority condemned. If the inlet arm of the reversed S, so to speak, be of the same length as the outlet arm—viz., the soil-pipe, stagnation will result, and has given rise to a host of mechanical appliances for inducing an air current to relieve the stagnation. We find none of these appliances provided. Provided the manhole is as close to the wall as the inlet here shown, it might be covered with a grating. A goodly number of cases may be seen with this arrangement working perfectly. Slight deviations in the air current are considerable impediments to its entrance and should rather in every way be facilitated. The principle remains that the air inlet should be at ground level or as near it as possible. The air of a well-flushed and well-ventilated house should be scarcely perceptible to the senses. Properly constructed back currents should be almost out of the question. That four inches is sufficient diameter for an ordinary house-drain is not accepted by all sanitarians, but one principle stands out prominently in ventilating drains—never the diameter of the pipes used. The air outlet must always equal or exceed the diameter of the inlet. If there be two soil-pipes in connection with the drain this is likely to be the case, but not so if there is only one. It is preferable there should be only one, for very obvious reasons. In this case we have only one and in order to equal the area of inlet and outlet may be equal the diameter of the drain and soil-pipe are of the same diameter throughout.

The house-drain and soil-pipe are one continuous tube, constituting the only true drain. One horizontal tube of the same diameter throughout the joints air and water tight, runs from the forecourt manhole horizontally with an easy downward pitch to a point below where the closets tower on, and here assuming the vertical discharges pass without curve or bend to its termination above the roof. Even slight curves or bends impede the air current. There are only two windings, the inlet at its lowest point in the forecourt manhole, and the outlet at its highest above the roof. This is a methodical advance; out of the minds of sanitarians are gradually condensing definite principles of drainage. All pipes, from whatever source discharging into this vertico-horizontal drain, are water-trapped, so that the air current in it is not retarded. Into the vertical portion or soil-pipe pipes carrying excrement discharge, and into the horizontal portion only branches from the main drain. All other pipes, except the excremental air flow pipes, discharge in the open at ground level to the gullies, either directly or indirectly, the rain-water pipes. The rain-water pipes are supplied with open heads at each floor level, into the waste-pipes of each floor discharge. Piggy-back the safe trays and cistern overflows, which are usually dry, merely project through the wall above their own floor line into the open air, thus resembling old gargoyles. So that all pipes except the excremental are quite independent of the delivery of gaseous matter or vitiated air. Each waste

ped, not as part of the system, but to prevent
ght blowing up, and the safe tray pipes have
r the same purpose.

t it in a tabular form :—

I.—*Drain.*

portion—A. Excremental pipes } all trapped.
al portion—B. Gully branches }

1. Waste pipes of basement.
2. Rain-water pipes.
 - a. Upper rain-water pipes.
 - b. Waste pipes of upper floors.

II.—*Gargoyles.*

v pipes from

- a. Cisterns.
- b. Safe trays.

tion must be taken to the housemaid's sink
ing into a rain-water head and close to a

The smell of slops is very powerful and
noble. It appears that slops are not intended
rown down the housemaid's sink, but that
to be thrown down the water-closet, the
which is hinged and folds back for that

One would suppose that the obvious use
k was to receive washings and slops. Wild
ould fail to drag the idea from the most
nt housemaid, the contrary notwithstanding.
re serious objections to throwing slops down
osets. The best of drains are liable to
e from brushes, flannels, soap-cakes, and
neous articles that careless housemaids pour
fording an argument in favour of larger-sized
an 4-inches. The use of the hinged seat to
et would have been more happily demon-
on the same floor as the sink instead of on
below. Whilst inspecting this water-closet
ing incident occurred. I was explaining the
f the houses to a distinguished French sani-
nd lifting up the hinged seat of this closet,
d the pan standing up free from the sides in
re of the open space, and beneath it the lead
its small pipe discharging through the wall
air. There was no tray level with the brim
the spillings of the slops and run them
to the pan, and so prevent them from
into the lead tray beneath. 'Ah ! que
ntil,' remarked my French friend ; 'comme
lite la supervision. Si la femme de chambre
igente en vidant les urines dans le water-
u lieu de couler sur le parquet, elles couleront
e des passants. Vraiment ! cela facilite beau-
x police sanitaire.' That was certainly the view
question from the other side of the channel.
nothing gained by throwing slops down a
flushed water-closet, but there is at least
against obstruction in throwing them down
with the waste-pipe protected by a guard.
ve the principle that all excrement dis-
pipes should deliver into the vertical or
s, and, as the housemaid's sink will un-
ly become a receptacle for diluted excre-
should follow the rule. The housemaid's
ould rank as a water-closet. The waste-
m it should be trapped, and discharge as
pipe of a water-closet. Three water-closets
le accommodation for a house this size.
most closet space is unoccupied. By re-
the housemaid's closet to the topmost floor
y above the other closets in the section of
e devoted to them, the difficulty is solved at
it may be so placed on an intermediate floor.

The basement closet on the same principle might
be made to discharge by a shorter connection. With
these two trifling amendments, the principles of
drainage of the sanitary house can scarcely fail to
be grasped as a system by those interested. We
notice that there are no wash-out closets. Professor
Corfield has pointed out that the reason valve-closets
are looked upon with great favour is because by
storing a panful of water, and delivering directly
downwards on to the trap beneath, they give the
greatest power of a full and vertical flush. The
overflow-pipe is the opprobrium of the valve-closet.
Now that flushing-cisterns are becoming universal,
if the overflow-pipe were cut short, the safe beneath
(made a little deeper) would become in reality an
overflow-tray, and valve-closets might possibly rise
in favour. A flushing rim to the pan of every closet
is now a *sine quâ non*.

Passing to the solid refuse. Its disposal, removal,
and collection scarcely come within the power of the
individual householder, but its storage he is obliged
to provide for, and the intervals of its collection
affect him considerably. With the abatement of
smoke, and also the increased use of gas for cook-
ing and heating, house refuse will consist more and
more of vegetable and animal refuse and less and
less of ashes, entailing a corresponding rapidity of
collection and a diminution almost to vanishing
point of storage. The daily (possibly nightly) col-
lection of house refuse is 'a consummation devoutly
to be wished,' and a measure of acknowledged sani-
tary importance. It is scarcely likely to be en-
couraged by the rather large-sized galvanised iron
dust-bin without wheels, ironically called portable,
although a decidedly improved substitute for its very
roomy wooden congener firmly rooted next door.
Could a dustman easily manipulate such an iron
bin-full ? Would a house this size accumulate this
bin-full in a week ? Possibly it might. But certainly
not in a day. For the sake of precept a good
example might be set to householders and a dust-
pail sufficient to hold only one day's dust, or at the
very most two in case of mischance, prominently
exhibited as the correct thing. Its use, collectively
by a large number of householders, would prove that
efficient a *posteriori* force which is the only earthly
power that can move a corporate body.

The water supply. Firstly we observe that
every water-closet is supplied with a flushing cistern
preferably of the syphon type invented by Mr.
Rogers Field. This provides the happy mean pre-
venting the use not only of too much but also of too
little water. But its most important function is to
isolate this water from the general supply. Double
precautions appear to be taken, for the supply pipes
to the flushing cisterns are still further isolated
from the dietetic water by having a separate
storage cistern specially to themselves. Because
draw-off taps are liable to have drinking water
taken from them, even when not so intended, they
are all supplied from the drinking water cistern.
(The placards numbered 41 and 44 have evidently
been accidentally interchanged, which is rather con-
fusing.) It is considered politic for each supply pipe
from the cisterns to have a stopcock for cutting off
the water if necessary. Also for the main-service
pipe to have a draining tap for frosty weather. The
overflows from the cisterns are merely led into the
open air. Altogether the excellent manner in which
the storage, distribution, and isolation of the water
supply is carried out leaves nothing to be desired.

It is a beautiful example of the intermittent system, but it is perhaps to be regretted that preference should have been given to this system. Even in overgrown London the water companies are adopting the constant supply on a gradually increasing scale. That system is now generally admitted to be infinitely superior. An opportunity presented itself for illustrating what is doubtless the system of the future; for giving some authority upon water meters, the arrangement of pipes, fittings, flushing cisterns, taps, and stopcocks in connection with a system of constant water supply.

Turning to the ventilation, warming, and artificial lighting, we find it less easy to grasp the primary principles involved, due in a measure to the necessities of construction. Let us take the ventilation and warming first, because it is a much simpler matter to supply fresh air to an ordinary dwelling-house if uncomplicated by the requirements of artificial lighting. In summer natural ventilation suffices. In winter or eight months in the year we resort to artificial ventilation. Artificial ventilation may be effected by the extraction of the foul air (vacuum method), or by the introduction of fresh air (plenum method). In both cases in the dwelling-house heat is the motive force. The admitted air may either be cold or warmed. Mr. Ernest Turner says the former is uncomfortable, the latter costly; so that in practice the more nearly the actual supply is graduated to meet the actual needs the better. The Sanitary House has a stove on the ground floor, which introduces warmed fresh air to the passages and staircases. This, which is really a plenum method of air supply, answers a double purpose. It prevents air being sucked into the house from infected sources, and supplies in its stead pure warmed air to the section or shaft of the house devoted to the staircases. For the rooms the ordinary means of ventilation are the windows, doors, and chimney-flues, and during the daytime they amply suffice. The fireplace as the outlet extracts the air (vacuum method), and the windows and doors as inlets admit it. The windows by inter-sash ventilation admitting cold air and the doors admitting warm. There seems to be a great gain in utilising both methods. Warming the admitted air in detail for each room, as by Captain Galton's grates, does not appear to have found favour, or, what is more probable, the demonstration of the working of grates, flues, and chimneys was not found practicable in a structure of this kind.

The extraordinary means of ventilation required during the use of artificial light are provided by longer or shorter tubes and valves as inlets in the outer wall, and longer or shorter tubes over the gas-lights and valves in the chimney breast as outlets. There are three possible methods of treating the ventilation of gas-lights; the first and worst being to take the air supply from and cast the products of combustion back into the room, as seen in the Insanitary House; the second and better being to take the air supply from the inner and cast the products of combustion into the outer air, as seen here in the Sanitary House; the third and best method is to take both the supply from and the products into the outer air, thus isolating the lighting from the air of the house. The favour in which the electric light is held unconsciously asserts this principle. One of the great gains in the use of electricity for private dwellings is that it does not demand special ventilation; because in its hermetically sealed globe (1) it does not foul the air, and therefore requires no in-

creased extraction; and (2) it does not cool air, and therefore requires no increased intake. Wherever it was possible to supply a gas light from an upcast shaft it should be possible to supply a downcast, and it wants but little more to get it completely from the dwelling, without the need of costly special apparatus. Gas would thus be further assimilated to electricity in reducing the risk from fire to a minimum, and avoiding the draughts caused by unequal draughts. Lighting the room would be an impossibility without the isolation of the gas-lighting system complete as that of the drainage system and the air of the house? The introduction and use of electricity points out this principle.

In conclusion, this goodly sized model paper with most important indications for house construction without placing any particular system in relief. For those who construct our dwellings seek primary principles to guide them, this paper may facilitate their endeavours to get out from amongst the numerous sanitary a-

SMOKE CONSUMING LOCOMOTIVES.—In a paper read at the meeting of the British Association for the Advancement of Science at Montreal, by Mr. J. Barrow, an anthracite burning locomotive, the statement on the authority of the Reading Railroad at Plattsburgh, large users of anthracite, that 1 lb. of anthracite produces 6 lb. of water; 1 lb. bituminous coal, 7 lb. of steam, under similar conditions. Comparing the cost, and the economic efficiency of 76 per cent., bituminous coal, 76 per cent. The Pennsylvania Railroad reported to be 25 per cent. the more costly fuel. As described the locomotive for burning anthracite has the advantage being the small amount of dirt, free from smoke, and cleanliness, which it is highly favourable for passenger service. It is not used by any of the anthracite mines.—An engine of a new type has recently been constructed by the Brooks Works for the Chicago Locomotive Iron Works Company. The head-light is placed where generally is, while the stack at the rear of the boiler and close to the cab. The boiler is one of the latest manufactured (what is known as a 60 inch) and the smoke, gas, &c., traverse it twice, bottom and over the back on the top to the chimney. This makes such a good combustion that the fuel, the gas, and the smoke are almost completely consumed, and when the engine is going at full speed it is impossible to see any smoke. The smoke is very small, being not more than 7 in. to 8 in. in diameter. The patentee, Mr. Charles B. Coventry, claims the advantages of this invention that it gets a strong draught, reduces the waste of fuel to a minimum, throws no cinders, sparks, or fire. The locomotive is peculiar in appearance, but it is said that it does well. It weighs 40 tons.

THE COLLECTION OF REFUSE.—The Vienna Sanitary Authorities have recently adopted a new method of refuse collection, based on the assumption that infection is not unfrequently mixed with dust, sweeping, and that by transporting such rubbish on open carts there is at least a possibility of disease being disseminated along the route of conveyance. The method consists in having all refuse put into barrels with tightly-fitting heads. These barrels are then carted away to the proper locality, emptied, and then returned. In order that every householder keep his own, the name and address of the owner are painted on each barrel. The Vienna Authorities are making a valuable experiment, and if it prove successful and not too expensive, it may be hoped that other cities will not be long in following so good an

IMPROVED DWELLINGS FOR THE WORKING CLASSES AS SHOWN AT THE HEALTH EXHIBITION.

By JOHN PRICE.

CONSIDERING the great outcry we have heard of late respecting the housing of the poor in London and other large towns, it might be naturally expected, that we should find in the Exhibition, the details of comprehensive and practical plans for dealing with this important question; but a somewhat careful examination of the various models and plans exhibited, leads us to the regretful conclusion, that little real progress has been made towards a satisfactory solution of the great problem of the day.

Several excellent models and plans of improved dwellings are shown, but the majority of them are attended with a common drawback—the very excellence and costliness of their arrangements and fittings prohibits their use by the real labouring poor, by reason of the improved rents which are necessarily demanded to make such dwellings fairly remunerative. The poor coster, the dock labourer, and the immense army composed of other poor people always to be found in London, who cannot boast of any regular income, and who literally live from hand to mouth—these find it utterly impossible out of their limited resources to pay the rents asked for accommodation in those palatial residences which have lately sprung up so rapidly in almost every district of the metropolis; they are thus compelled to ‘move on,’ and give place to their better paid and more fortunate brethren.

The plea urged by the promoters of these new blocks of dwellings, is that although they do not profess to provide accommodation for the very poor, that class is indirectly benefited, as the old houses vacated by the tenants of these new blocks are thus thrown open to them. These vacated dwellings as a rule will be found in some degree superior to the lowest slums, which were perhaps previously the limit of the choice of the residuum.

Unfortunately this view of the case is not universally accepted by those most affected by the building of these huge blocks on the site of their old homes, who complain sadly of being thus evicted, and obtaining no satisfactory compensation. It is not my intention, however, to enter into any dissertation on this phase of the question, but merely refer to it *en passant* as one which is frequently encountered by those who come in daily contact with the poor. It is a much more agreeable task to glance briefly at the various models and plans exhibited.

The premier place must be awarded to the Improved Industrial Dwellings Company, whose plans, elevations, and models of buildings form a conspicuous feature in Class 32 (main entrance). This company has for the past twenty-one years devoted more capital and perhaps exercised a greater influence in this direction in London than any other agency. The company now possess thirty-one blocks of tenanted dwellings in various parts of the metropolis, some of large extent. They have also four other sets in course of erection. When these are finished they will have provided accommodation for a total population of about 25,000 souls. The various blocks of the company are pretty well known landmarks to the residents of London, and it is unnecessary to refer to them separately, but will

rather confine our remarks to the extensive blocks at Soho, formally opened by the Prince of Wales on July 8, but not yet quite finished, as embodying all the improvements suggested during the long practical experience of the company. (See SANITARY RECORD for Aug. 15, vol. xv. p. 78.) A glance at the plans of the two blocks shows that not only the company, but also their tenants, will profit largely by such experience. The improvements over the old blocks consist mainly in an increased size of the rooms, with a better arrangement for allowing a perfect current through, thus securing good ventilation without the aid of mechanical contrivances, except that the fanlight to be found over every door can be opened or closed as desired. Another improvement in the front elevation is the absence of the balconies giving access to the dwellings on each storey—which in this case have been judiciously removed to the rear—the front of the Sandringham Buildings, therefore, present the appearance of ordinary houses, and this symmetrical if not ornate design, will be a credit to the new street, as well as to the architect. It has always been a cardinal feature in this company's arrangements that each dwelling be essentially self-contained and that the tenant should not have to go outside his own door for any convenience. It must be admitted that in some of the older blocks of the company this advantage has only been obtained by the sacrifice of other equally desirable features—viz., the complete isolation of the water-closet and sinks from the living rooms and unrestricted light and ventilation. In the newly-erected Sandringham Buildings, no valid complaint can be made on this score. The water-closets are well separated from all the rooms, and placed against the exterior wall, and ventilated by a good window. Another noticeable improvement is the dust shafts, which are now so contrived and placed as to give the tenants no inconvenience. One of the most pleasing features of the arrangements is the liberal allowance of playground for children—a necessary adjunct to buildings of this description, but not always met with where land is of such value. Taking all things together, the company may be congratulated on the success they have achieved, and, considering that they will probably derive a handsome revenue from the forty-four shops on the ground floor, let us hope that they will be able to accommodate some portion of the late inhabitants of the site. The company being their own builders, have a guarantee that the work is carried out in integrity. They also exhibit specimens of sanitary and domestic appliances and materials used in their buildings, which are all of good quality.

One of the most attractive elevations of artisans' dwellings shown in the Exhibition are those designed by Mr. E. Hoole for the Lambeth Dwellings Company, in the Lambeth and Kennington Roads, which were erected at a cost of about 20,000*l*. Some people may possibly object to the Gothic design of this block; but it is certainly preferable to the repulsive, barrack-like appearance of those early blocks of dwellings which provoked the antagonism of those for whom they were erected. Here again we find the ground-floor utilised for shops, which must materially assist the revenue. The sanitary conveniences are placed outside the dwellings ranged in a well-ventilated corridor, so that there is little fear of any effluvia reaching the tenants from that source. The block has a sound and substantial look about it, being the

product of a gentleman who has devoted considerable study to the requirements of the working-classes. (*Vide* SANITARY RECORD, April 15). I believe the company are content with a less dividend than 5 per cent. for the excellent accommodation they offer.

The National Model Dwellings Co. of 49 Cannon Street, E.C., exhibit plans and elevations of the large blocks of dwellings they have acquired, and which are situated on the site of the old Queen's Bench Prison in Southwark; these are six stories high, have a good appearance, and from their eligible situation (being close to the Borough Road Railway Station) they always command good tenants; again we find the ground floor appropriated to shops; the arrangements do not call for any particular comment.

Mr. James Webster, of Doughty Street, exhibits the plans, &c., of a small block of improved dwellings, erected in Whitechapel for A. L. Dussek, Esq., which, for convenience of arrangement and quality of material and workmanship employed, are second to none, the proprietor being probably actuated with the idea that where everything is of the best, repairs will be less needed. In London there are always to be found a sufficient number of well-paid artisans, able and willing to pay for superior accommodation. The block is only four stories high, with laundry and drying-ground on the roof. The dwellings are fitted with dressers and cupboards nicely painted, as well as other conveniences which are doubtless appreciated by those who can afford to pay for them.

Mr. Edward Clarke, of 6 Adam Street, Adelphi, exhibits drawings of blocks of industrial dwellings, erected in different parts of London, which do not show any original designs. The Corporation of Liverpool is one of the few municipal bodies in the kingdom who have had the courage to take the bull by the horns in grappling with the difficulty which has dismayed less energetic bodies. The plans exhibited of the extensive blocks of dwellings now being erected at Nash Grove for that Corporation, are a splendid testimonial of their determination to do their duty, and should incite other Corporations to follow their example. (*See* SANITARY RECORD for March 15, vol. xv. p. 437.) There is no doubt that Liverpool is much indebted to Mr. A. B. Forwood, Chairman of the Insanitary Committee of the City Council, for carrying out this laudable design to a successful issue. Mr. Forwood has long taken deep interest in the important question of housing the poor, and his contributions to the literature on the subject are much valued. His description of the thirteen blocks now being erected at Nash Grove will be found on page 291, vol. xv. of the SANITARY RECORD, together with a mass of other interesting information. Drawbacks to the success of blocks of dwellings are met with in the provinces which are rarely encountered in London; they cannot be gauged by a common standard, and are much affected by local influences.

The Oddfellows' Co-operative Building and Investment Co., of Manchester, exhibit plans and photographs of houses which have been built and purchased by thrifty workmen, through the aid of the Company; they are admirably designed, and visibly teach us the benefits of self-help. The other drawings, &c., of improved dwellings in the Exhibition, though of much merit, present no peculiar features needing any detailed description.

EVEN delirium-tremens is now traced by German physiologists to a micrococcus—'the worm of the still.'

THE SANITARY RECORD

SEPTEMBER 15, 1884.

The Editor will be glad to receive, with a publication, announcements of meetings, proceedings, and abstracts or originals of read before the members of any sanitary or association.

THE THAMES VALLEY DRAIN

BOTH the rivers that supply the metropolis drinking water have lately come in for much indignation, and a good deal of somewhat writing has gone on as to the sewage pollution which they are exposed, and the dangers public health likely to arise in consequence. The Thames nor the Lee is an ideal source of potable water; but it is necessary in fairness to set out exactly the state of affairs with regard to the river, in order to see how far the recent about their insanitary conditions justifies as to the safety of the water which their upper supply. The case of the Lee is fully set out in a separate article on page 92; and may be advantageously explained to those acquainted with the Thames the relations of admitted pollution of that river to the question of the purity of its water as a beverage, in order to prepare the mind for an accurate survey of the present position of the drainage of the Lower Valley.

In order to understand the position of the pollution question, it is necessary to supply the River Thames divided into three districts: first, and the most important as regards the water supply, extends from Cricklade to the source of the London water supply near Hampton. The second district, a trifling discharge of sewage at Henley is not remedied, and part of the sewage at Staines flows into the river. Against this local source of pollution three convictions have been obtained by the Conservators, and, in consequence, the evil is to be remedied. With these two not very important exceptions, the whole of the sewage from the towns and smaller places above the London water supply has been diverted from the river. The third district, passing down the river, from the sources of the London water supply near Farnham to the limit of the metropolitan area below Chiswick, sewage from all the towns, except Twickenham, still passes into the river. The towns thus polluting the river are included in the Thames Valley Main Sewerage Board's district, and the penalties of the purification clauses of the various Acts having been suspended in the year 1875 by an Act of Parliament confirming a previous order granted by the Local Government Board for the third district, from Chiswick to the Metropolitan Sewage Outfalls at Barking and Crossness, sewage is exempted from the operation of the various Acts, and the sewage works are under the control of the Metropolitan Board of Works. The Royal Commission is still inquiring into the pollution of the river by these sewage works, and deal with the bulk of the sewage of the metropolis.

the second of these districts that we propose direct attention.

tory of the Thames Valley drainage is a very able proof of the difficulty of carrying out in the way of remedy for river pollution. A good many years since a Royal Commission was presided over by the Duke of Richmond, and the Thames as a sufficient and proper water for the metropolis, provided it could be kept sewage. The Metropolitan Board of Works established to do this as regards London, and splendid main-drainage scheme it has done so extent of intercepting the sewage from both of the river, and carrying the outfall some own. The quantity, however, has of late increased so much that a good deal comes up the tide, and the point of outfall will ultimately long have to be carried a great deal down, or, if possible, kept out of the river. Hence, the intake of the London water company has been successively moved up from Rotherhithe, Lambeth, Chelsea, to Seething and West Moulsey. The main-drainage had materially improved the quality of the water at the lower intakes, but it became manifestly necessary to prevent sewage from getting into the water from the populations fast aggregating on the banks above the scope of these works.

The towns from Lechlade to Putney, a stretch of some miles, had, by the Acts then in force, been enabled, at great cost, to establish sewage systems along the river. But when the Duke of Devon's Committee reported in favour of taking London water supply from the Thames, London

Act passed compelling all these places to spend more money in undoing what the previous Acts had compelled them to do. The worst of it was that while they were compelled, under heavy penalties, to prevent any sewage from reaching the river, they were not told how else to dispose of it. In fact, no other mode was pointed out, and none was known, and so, while the Act of 1867 with 100*l.* a day of penalty on offenders, up till now the sewage of the riverine flows into the river pretty much as it did in 1867, and in increased quantity. Yet the Acts have made persistent and energetic attempts to obey the law, but unfortunately the Act imposed the penalty did not give the necessary means for acquiring land, or for constructing works necessary to dispose of their sewage. Kingston, London, Hampton, Barnes, Mortlake, Kew, Esher, and Isleworth have successively made attempts, singly or jointly, some of them several but so far have met with nothing but failure, by interested parties, or by proprietors convinced that such works anywhere within a radius of two would damage their property.

At these places are now at the mercy of London, and can at any time proceed for penalties, and has been done so. It did so and recovered them from London, and though that town got a special Act some years of grace free from penalties, those have expired, while no scheme has been found yet, and the sewage still runs to the river. At Kingston Wick was proceeded against, and penalties of 98,000*l.* were claimed. The rateable value of Kingston Wick being 11,000*l.* a year, such penalties would soon have swamped the fee-simple of the parish. This violent step, however, led to the formation of a Joint Board, to include all between

Hampton and London, with the exception of Brentford and Twickenham. All the localities were relieved of their penalties and of their obligations as to sewage, and three years from 1877 were allowed to the Joint Board to carry out the work. The Joint Board set about their task energetically; they got plans from the most eminent engineers, and after full consideration adopted the best, and set about carrying it out; but on considering their powers they found themselves at fault. They required several crossings of the river, and the House of Lords had decided that while the right to acquire lands for their purposes could be got by Provisional Order, water rights or power to make works in the river channel could not. One plan after another had to be discarded, and when they tried for an Act of Parliament they were defeated. They then fell back on a scheme for lands at Mortlake, where the sewage was to be precipitated, and the sludge, heretofore the trouble in all precipitation schemes, was to be dealt with by pressure and reduced to practicable shape. They got a Provisional Order from the Local Government Board this year, but it had to lie before Parliament for forty days for ratification, and before these had expired the House of Lords, moved by interested objectors, threw it out, and so matters remain as they were before.

Thus we see that local authorities most anxious to do their duty, and spending much money to do it, were baffled singly or in small combinations for ten years, and when at last a Joint Board was established, and three years more were allowed for the work, the same baffling process has gone on for no less than seven years, and the sewage runs into the Thames as before, nothing having been accomplished except the expenditure of some 28,000*l.* of the ratepayers' money; while the Joint Board is now, and has been for about four years, in the position of 'a local authority that has made default in providing its district with sufficient sewers,' and its whole district is liable to heavy penalties.

IN the recently issued Report of the Commissioner of the Metropolitan Police for the year 1883, particulars are given of the operations of the police for the enforcement of the Smoke Nuisance Abatement Acts, from which it appears that—as noted in the *SANITARY RECORD* of June 16, Vol. xv., page 591—two-thirds of the offences against the Acts were punished by fines below the minimum of 40*s.* 'In steam boiler furnaces of the ordinary type very little advance has been made in reducing smoke. Mechanically stoked and certain other special furnaces, though efficient for preventing smoke, are inapplicable in the great majority of existing London works. In numerous instances the incompetency of the stoker is the cause of smoke, and it must be added that employers, in the absence of any system of certificates of competency, are at some disadvantage in securing qualified stokers. In restaurants, hotels, &c., the heating and cooking apparatus used has, in many instances, been very considerably and beneficially modified within the period under consideration. The use of gas and coke for heating purposes has also much extended, and in that proportion the smoke has been diminished. A very large quantity of smoke, which is preventable, however, still issues from these establishments, which are increasing fast, in size and number, in almost all districts. Smoke is still being produced by the potteries of the metropolis, and proceedings are, after the necessary cautions, taken against the stokers or proprietors as may be necessary. Until improved systems of furnace are adopted, such as are successfully in use in some parts of the kingdom, the smoke from these sources is not likely to be reduced.'

ALCOHOLIC DRINKS.

A RECENT voluminous and able article in the *Times* on alcoholic drinks, with the correspondence and a somewhat apologetic leading article which followed, have drawn considerable renewed attention to the burning question of alcohol. Most of the correspondents of the leading journal were indignant at the assertion that teetotal societies 'do very little good, and a great deal of harm,' and at the contention that teetotal advocacy is the wrong way to go to work to cure drunkards. Few unprejudiced persons will deny that the writer of the first article here went entirely out of his way to cast an unmerited reproach on an agency which, after every allowance for its failures, has accomplished a wonderful work in the permanent reformation of a very large number of pronounced inebriates. Alive to this false step, the *Times*, in a sympathetic leading article, returned to the subject, and frankly admitted that the drink question as a whole involves wider issues than mere individual gratification; the design of the original article having been of a more limited character—viz., whether temperance or total abstinence is the more healthful and helpful to the average members of society.

In the course of his argument the writer in the *Times* evinces on the one hand considerable insight into the physical development of inebriety, and, on the other, falls into several errors which it may be well to point out.

He fully recognises, what many abstainers have not yet seen, the existence of a class of inebriates labouring under 'a manifest disease,' constant or intermittent, but uncontrollable during the paroxysm. For these the proper remedy is restraint or seclusion in a home for inebriates, freed from all temptation to drinking. He also rightly calls attention to the defective character of the usual temperance rescue work, in so far as that does not attempt to deal with the causes of inebriety in the individual. If temperance reformers would study the proceedings of the Society for the Study and Cure of Inebriety they would acquire a knowledge of the predisposing causes of the indulgence of their converts, and thus be in a position to arm these latter with weapons capable of resisting their innate foe, or, still better, be enabled to so restore sound health of body and mind as to prevent a fresh outbreak. The writer hits, too, a blot in the teetotal propaganda. Excitement is not strength, nor enthusiasm permanence; and reliance either on these, or on the wearing of ribands by the habitual drunkard, is inadvisable and unsafe.

With much common-sense the *Times* mingles many fallacies, the approving production of which in the present day amounts to an anachronism. It is claimed that excessive drinking is not so much a cause of crime as the outcome of a criminal propensity. This is in accordance with the view that all inebriety has a physical origin, and that the inebriate is only exhibiting the symptoms of disease in his drunken eccentricities; but is not the view commonly held. With no desire to undervalue the disease aspect of inebriety, we fail to see how a murder committed in the fury of drunken madness by a man who, when unaffected by drink, has been incapable of such of crime, and who was utterly unconscious of having killed anyone, can be credited to anything but alcohol. One might with equal propriety declare that the dislocation of a shoulder-

joint from inability to stand on one's feet drunken fit arises not from drinking, but from locating propensity. The judges, therefore, are in attributing a large proportion of crime to temperance, and (as Mr. Justice Hawkins Lincoln the other day) the absence of serious to the cessation of drinking. There is, however, a grain of truth in the writer's argument: then times a criminal propensity waiting only for relaxation by some narcotic to assert itself over act of horror. In such cases the man must clearly be credited with the deed.

The *Times* contends that alcohol supplies and is a valuable food. There are states of health where no other substance can be resorted to and where as a medicinal remedy the very amount of nutriment in an intoxicant, being administered in a form which can be utilised in the case of the exhausted patient over the crisis; an ordinary health alcoholic drink cannot be classed as a valuable or a safe food. On the contrary, it reduces muscular power and exhausts force. Taking into account all the saccharine and nutritive constituents in the most nourishing alcoholic drinks, so minute are their nourishing properties that one would become intoxicated and over again before coming within hailing distance of a scanty meal. Practically, alcohol is not a food, and certainly not a bland innocent food, strictly in a physiological sense.

The *Times* has fallen into a curious mistake supposing that the total abstainers have taken off their blue riband. The truth is that a minority of water drinkers have donned this, and many flaunt it who are in the habit of drinking intoxicants. It is also open to question whether the statement is accurate that the bulk of the ribbonites are sickly and feeble in appearance.

It is difficult to understand how so able a man could possibly recommend gin as the purest and best form of spirit. It certainly cannot compare for usefulness, when spirits are called for on therapeutic grounds, with whisky or brandy, unless for drinking purposes. The less said about its purity the better.

There can be little doubt that there are persons

Rari nantes in gurgite vasto,

whose health is improved by a restricted allowance of some mild stimulant, but for the great majority of men and women the writer's dictum that moderate drinking is more healthful than total abstinence is opposed to the evidence of accumulated experience and indeed crucial tests. Insurance companies would not offer them a lower rate of premium to abstainers than to non-abstainers, because the rate of mortality is lower among the former than among the latter: while the records of the sick clubs show that inability to work from disease exists in a proportionately greater number among the members who are not teetotal. The adult in ordinary health alcohol is not a hinderer of work. So with happiness. Alcohol blunts the senses, and lessens our capacity for pleasure. Other conditions being equal, the abstainer has a much keener enjoyment of life than either the moderate or immoderate drinker.

The writer is in error in the belief that the work of total abstainers is of a commonplace kind. The labour of both abstainers and non-abstainers may be mediocre, but some of the best work, physical and mental, which the world has seen has

l on total abstinence. Weston recently ipendous task, never before attempted, holic stimulants, delivering a witty, ture at the close of each day's walk of for four months consecutively. Other : shown splendid results under a similar ile such giants in intellect as Rolleston est the highest mental vigour without a xicating drinks. Among the first living : heir time are to be found well-known So far from alcohol aiding in the execu- work or in the perfection of intellectual y the converse is true. The tendency to take the edge off the more refined m perception, and to dull the higher he mind. To our thinking the most in- aching of the *Times* lies in the reference

The recommendation of claret and ate and fastidious children is as little in ith scientific practice as it is with pru- common sense. Such advice has no sound physiology, and if generally acted fraught with serious peril. Cases of nd of alcoholic cirrhoses have been re- ed of late years in children of tender ch startling particulars will be found in *Medical Journal* for August 23. gienic point of view we are bound to hole controversy, and from this stand- look is tolerably clear. There seems to assent, whatever the effect of a limited of alcoholic fluids as an integral part of ary of exceptional constitutions, to the of more than 2,000 English physicians ; thirty years ago, that the general adop- abstinence would greatly promote the appiness of the human race.

HERBERT BOYLE & SON, Ventilating Engineers. Viaduct and Glasgow, have been awarded nd only prize (silver medal) given for the International Exhibition, London, for elf-Acting Air Pump Ventilators and system

ON.—If you live in a town don't cry over amine it closely and you may find it is not

it meeting of the Dover Town Council, a xtending the sewer outfalls and further drainage of the town, consequent on the borough, was approved. The approximate ume is about 10,000/.

Russian factory law imposes the following the employment of children :—1. Children rom ten to twelve years are only permitted ng the day in certain specified industries. rom twelve to fifteen years are to be allowed ork in spinning and textile factories, as well orks. 3. Work is formally forbidden to r fifteen years in the following branches of ng others, in mills where lamb's wool, felt, and down are worked up; in bleaching ashing, bleaching, and dyeing; in cloth lling, teaselling, and shearing machines; in dyeing works; in all unhealthy work in cin and parchment works, except in some ents; in varnishing leather, in grinding onic and turpentine products; in potteries ks—for the preparation of material, turning, lishing and baking (moulding is authorised); re lime and alabaster are fired.

SULPHUR AS A DISINFECTANT.

It is to be feared that in estimating the value of various modes of disinfection enough attention has not been paid to the difference between deodorants and disinfectants. If by the latter we mean agents capable of destroying the danger arising from infection of whatever kind, we may assert with confidence that they are few in number as compared with the former. Russian leather might fairly be called a deodorant, but it is certainly not a disinfectant. Indeed, we are inclined to suspect that, in the search for new and so-called scientific methods, too little attention has been paid to a method older than them all, the thorough and repeated use of the scrubbing-brush and soap and water; too often the masking of one stink by another has been all that has been attempted.

The burning of sulphur is one of the oldest methods of disinfection, and still remains one of the best. The room to be disinfected should previously be well scrubbed with soap and water; not merely for the sake of cleanliness, but also because it is found that the action of the sulphur is facilitated by moisture; if two strips of blue litmus paper, one moistened and the other dry, be placed in a vessel with burning sulphur, the moistened strip will be found to be reddened more quickly than the dry one. All the windows, doors, and ventilating apertures should be closed before the sulphur is ignited, and not be opened for four-and-twenty hours. A convenient mode of burning sulphur in a large apartment, such as a hospital ward, is by means of a workman's devil—i.e. a bucket with perforated sides and bottom. This is filled with shavings and coke or coal, and, owing to the thorough draught, soon gives a good fire. The sulphur is put with the coals, and a large kettle placed on the top of the 'devil,' by which means steam is diffused through the air and the requisite moisture obtained. A few saucepans containing sulphur, and, if wished, a little methylated spirit, may also be placed in different parts of the room. Seven pounds of sulphur will suffice for a large ward. By some the quantity required is reckoned at half an ounce for every ten cubic feet of space.

For ordinary rooms a gas stove may with a little ingenuity be so arranged as to burn the sulphur and keep a kettle steaming at the same time. If some such device be not adopted, a practical difficulty is often found in keeping the sulphur alight. (See p. 118.)

In the process of burning the sulphur unites with the oxygen of the air to form sulphur dioxide, which is easily recognised by its acrid odour. This sulphur dioxide or sulphurous acid combines with free ammonia, and also decomposes any hydrogen sulphide present in the air; it thus acts as a valuable deodorant; it has been supposed to act powerfully upon organic matter, especially in the absence of free ammonia; it has also been stated to completely disinfect miasmata. It is said that the hypothetical bacteria of disease are more easily destroyed than the ordinary bacteria of decomposition; but De Chaumont and others have found that 'disinfectants' required to be used in poisonous quantity before they affected low forms of life such as bacteria. Moreover, some disinfectants, as potassium permanganate, have little action on bacteria, whilst alcohol prevents the development of these organisms but is no disinfectant.

NOTES OF THE MONTH.

ISLE OF WIGHT SANATORIUM.

A NEW health-resort has just been opened at Blackgang, in the Isle of Wight, which seems calculated to supply a long-felt want. The establishment consists of a mansion with out-houses erected upon an estate of some forty acres. The property, which was formerly known as Southlands, belonged to the late Rev. E. B. Puzey, D.D. It was transferred in April to its present occupiers, who have since kept numbers of workmen employed upon it, in order to adapt it for its future purpose. It will at present accommodate about twenty inmates; but with the addition of other premises which are shortly to be built, between sixty and seventy persons will be able to be received. It is intended for invalids requiring change of air and scene, who object to the monotony of ordinary seaside lodgings with their small variety in diet, and to hotels with their attendant excitement and irregularities of all kinds, which are so unsuited to the convalescent or to the fatigued and dyspeptic dweller in towns. But if the sanatorium is not an ordinary hotel, neither, on the other hand, is it a hydropathic establishment; it is to combine the advantages of the two, and to be conducted in such a manner as to make it a suitable site for those who desire a quick return to health and strength. Rest and fresh sea-breezes, with the surroundings of splendid coast-scenery, will be at all times obtainable, and those by whom such adjuvants to convalescence are required should here be able to satisfy completely their very natural longings.

The sanatorium, being situated between six and seven miles from Ventnor, is approached from London by train to Portsmouth, thence by steamer to Ryde, by train again to Ventnor, and finally by coach to the destination. The train leaving Waterloo Station at 11.35 A.M. seems well suited to the would-be traveller; as it lands him at Blackgang at about 5 P.M., and allows him to take a luncheon at Ryde Pier Head, after the arrival of the boat from Portsmouth and before the departure of the train for Ventnor. The route from Ventnor follows the well-known road through the Undercliff by Steephill Castle, the Royal National Hospital for Consumption, and St. Catherine's Point. At this stage of the journey, on a fine day, the southern coast of the Wight is seen ahead to the west, trending away to Freshwater Bay and the Needles; on the right hand is the high cliff extending to St. Catherine's Down; while to the left, between the roadway and the sea, nestles the sanatorium. From this description it will be obvious that the locality is thoroughly protected by the uplands from all northerly and easterly winds; at the same time it is open to the south and to the sea.

The roadway conducts one down the cliff to the lawn and the house, which are situated on a plateau about 150 feet above the shore. The residence has been fitted with all the newest sanitary appliances, including the ventilation of soil-pipes, Tobin's airshafts in the bedrooms, the best flushing system in the water-closets, a Jennings' bath, electric bells, and a liberal use of asbestos non-inflammable paint over all woodwork employed in the building. The amusement of the inmates has been liberally provided for, there being a billiard-room, lawn tennis and croquet ground, bowling green, archery ground, and other sources of recreation on the property

itself, whilst the adjoining cliffs, shore, and can be utilised for most varied walks and excursions of all kinds. There is close to the ground widely-known Sandrock aluminous chalybeate, to which the inmates of the sanatorium will have free access at all times. The general water of the establishment is irreproachable, and as a spring from the cliff far from all fear of contamination whatsoever. There is a good kitchen garden well stocked with vegetables, and the grounds are generally bright with flower beds and many bright evergreen and other shrubs. The kitchen department, it is promised, shall be well attended to, and altogether the establishment seems likely to prove highly restorative to those who seek recovery of strength and vigour within its walls. The honorary medical council, which includes thirty medical practitioners, metropolitan and provincial. The terms seem to be moderate, and inclusive, so that the cost of residence can be exactly reckoned beforehand. Mr. Anthony Brook, of 20 St. Helen's Place, London, E.C., managing director, and will gladly furnish particulars that may be required.

THE NEXT EXHIBITION.

ALTHOUGH the Health Exhibition has not been in full working order until nearly half its allotted time has expired, preparations for its successor are being made. During the coming year we are to have an International display of Inventions and Instruments. Upon the latter the SANITARY RECORD will not have much to say, but sanitary science has recently been such a wide field for invention; that we must be prepared to meet old friends with slightly altered faces, although the Executive Committee wish to exclude such exhibits as have appeared in the present Exhibition, or its forerunners, the 'Smoke Abatement' and the 'Fisheries' exhibitions. Exceptional circumstances will of course be pleaded on behalf of many who wish to contribute, and it is difficult to see how exhibitors can do otherwise than prove a good case. There seems to be no lack of the comprehensiveness of the prospectus, and the group is adequately represented (as desired by the council) only by recent inventions or improvements there should be no vacant space. Workshops, mines, sanitary appliances, as might be expected, are again included; in fact, every branch of the present show seems represented, apparent the addition of all the direct and indirect appliances used in manufacture or production. Food and agriculture, science and singing, are still to find a place, and such general interest having already been brought to bear upon similar details, it can scarcely be doubted that if such be continued the benefit at South Kensington will not be sufficiently large for these purposes.

SANITATION AT BRIGHTON.

THERE is no doubt that families run great risk of illness from the insanitary condition of the tenements occupied during the usual summer holidays, and were it not for the out-door life they lead under the circumstances, and the ever open windows to dilute the inner atmosphere of the tenements, we should hear of more cases of serious illness now brought to notice. It is no exaggeration to say that in many of the smaller seaside

the houses comply with the ordinary sanitary requirements of common sense, and it is only in cases in the larger towns that anything satisfactory state as regards individual can be pointed to. An example on a very scale of 'sanitary houses' is exemplified at Wighton, where a number of high-class flats have been completed by the building owner, Mr. T. Chappell, of Lupus Street, Pimlico. An invitation was issued to those interested, and a body of architects and sanitarians assembled to inspect the provisions made in this respect. All modern and accepted theories as regards subsoil drainage were shown in working order, and other points that would not be required in any house were wanted and put in practice here. Considering that these are flats or houses one above the other, it becomes evident that the drainage of a flat house has to be arranged for in a limited and the way in which these requirements have been met, formed the occasion for congratulation on the part of the experts present. A special feature of the construction of a large pipe-chamber in which all the other pipes are placed, and from which the different floor levels they enter the separate flats. No pipes, therefore, enter a residence, but those which belong to it. A lead lined pipe is also provided along the course of the pipes for each flat, and as this discharges into the pipe-chamber, no leakage in any one flat can inconvenience the residents of another. A permanent manhole is placed in this pipe-chamber by which the air can ascend. Where the soil-pipes enter the pipe-chamber a screw-off inspection cap allows the chamber to be cleaned out when necessary. The pipe-chamber is of cast iron, flanged and socket-jointed, and is open at the top above the roof. They are connected into a pit from which the main drain runs away; just before entering this pit the soil-pipe is syphon-trapped, the pit itself being ventilated by a pipe to the roof. Half-way between the pipe-chamber and the roof, an air shaft is provided, from which a current of air passes through the soil-pipes; this has been proved to be the case by repeated tests. The various other points are attended to in accordance with the principles laid down for the 'Sanitary Houses' at the Health Exhibition, and it speaks in favour of the movement that property of this kind can be carried on in this style without regard to cost, the one idea being consistently kept in mind that whatever is necessary to make it complete is included. When we see building owners who put the front like this, we realise the great progress that is being steadily made in this direction.

DECISIONS BY SANITARY AUTHORITIES TO SUPPLY WATER.

Reading daily journal reports a decision of the Government Board which it somewhat erroneously regards as of considerable importance to sanitarians throughout the country, though, as a matter of fact, it is of a very elementary kind. The chairman and members of the Milton-next-Sittingbourne Sanitary Authority were recently surcharged by the district auditor to the amount of between 30%., being the sum they had, by resolution, asked as an abatement to certain brick manufacturers on account of water supply. This company

owns all the cottages in the parish of Murston, near Sittingbourne, and the sanitary authority, in consideration of their taking the water for each dwelling, and themselves paying for the whole, agreed to supply them with water from the public mains at an abatement of 25 per cent. from the general scale of charges. The reasons stated by the auditor for the surcharge were that 'the abatement was made in contravention of the order of the Local Government Board, dated June 24, 1881, which fixes the scale of charges for water supply in the parish of Murston.' The Local Government Board, however, have very properly expressed their opinion that 'the auditor's reasons are not applicable to the facts of the case,' which was not a case in which steps were taken under sect. 22 of the Public Health Act to enforce a supply of water. That being so, the scale did not apply, and the authority were at liberty, under sect. 56, to enter into an agreement for supplying water on such terms as might be agreed upon between them and the persons receiving the supply. Under these circumstances, the Local Government Board considered that there had been no contravention of the order by the authority, and they, therefore, reversed the surcharge. Obviously this was the only course open to them. Auditors' auditing would become as great a bye-word as Justices' justice if ignorant straw-splitting of this kind were not officially frowned down.

WHOLESALE ADULTERATION.

ADULTERATION, like legitimate trade, of which it has been described as a particular form, has a wholesale and a retail aspect. The latter is rightly relegated to the analysts of the local authorities, and it would seem natural that the former should be controlled by those attached to the central authorities or departments through whose portals the goods in question must pass before being dispersed over the country. In some cases these would be the sanitary authorities of sea-port towns; in others, the analysts of Somerset House. It is monstrous that while the petty grocer is punished for selling adulterated goods of the nature of which he is ignorant, or as to which he has failed to satisfy himself, the same should be openly sold in the city, the auctioneers and buyers alike well knowing them to be unfit for food. Little is to be hoped from Somerset House, for no man can serve two masters; and, while exercising a vigilant control over all that affects the excise, the officials there seem ready to condone adulterations that do not, though why the special clauses of the Sale of Food, &c., Act relative to tea should not be extended to all articles of consumption we cannot imagine. But pending such amendment of the existing law, it appears to us unpardonable that the sanitary authority of the City should not interfere with the sale of adulterated goods in public auction, and by a single act save the country at large from being inundated with worthless or unwholesome articles. From time to time Messrs. W. and D. Harvest, as self-constituted inspectors of the pepper market, have reported in the papers, after ineffectual protests on the spot, for which they have been soundly abused, the sale of dirt and rubbish under the name of pepper dust or P.D., and now they report the sale of not less than 240,000 lbs. of pepper, the salvage from the recent fire at New Crane Wharf, saturated with water pumped from the Thames, which we know to be there at least little better than dilute

sewage. We heartily agree with Messrs. Harvest that when a competent judge of such things gives it as his opinion that any goods whatever are of an unwholesome or grossly inferior quality, the sale should be stopped by the City authorities pending an analysis, and that if these suspicions be confirmed by the analyst's report, they should then be condemned and destroyed. Once sold these goods are rapidly dispersed and can no longer be traced, and more good would be effected by one such seizure than by hundreds of raids upon small shopkeepers. The great sinners would be adequately punished and much irritation and seeming hardship incident to the application of the Act to the retail dealers avoided.

THE INSPECTION OF CANAL BOATS.

THE studied neglect of the claims to the Government Inspectorship of Canal Boats, created by the Act of this session, of Mr. George Smith, of Coalville—to give him the agnomen of his own choice—has been received by the press with universal dissatisfaction. But, for some reason or other, Mr. Smith is not a *persona grata* at Whitehall. The persistent manner in which he stuck to the original Canal Boats Bill until he got it passed in the teeth of the Minister nominally in charge of it has not yet been forgotten; and Mr. Smith has never been able to fall in with the official habit of letting things slide indefinitely. He has now to be content with seeing another reap the fruits of his missionary labours in the cause of the canal boatman. It is poor satisfaction to him, no doubt, that Parliament and the press should with one voice have united in bearing their testimony to the value of his work, and in giving him credit in initiating the legislative campaign, which has now culminated in the passing of the Act of this year. Yet, as the rewards of reformers go, this is a great deal; and Mr. Smith may be well assured of general sympathy with him in his present disappointment. The fortunate individual upon whom, in default of Mr. Broadhurst, the President of the Local Government Board has conferred the appointment, which was rightly Mr. Smith's due, has hitherto been unknown to fame. But as manager of Mr. Corbett's extensive salt works at Droitwich—a trade which is still largely dependent upon water-carriage—he must have had abundant opportunities of becoming acquainted with the habits and wants of canal boatmen, and so far there is a certain justification for his appointment. Let us hope that he will make canal boat inspection and regulation a reality instead of a farce.

EUTHANASIA.

ALL humane persons must from time to time be grieved at the amount of suffering daily inflicted on dumb animals at slaughter-houses. Many of us endeavour to repress emotions of this kind by persuading ourselves that such suffering is necessary. The recent experiments of Dr. Richardson, however, go far to prove that there is no reason why animals should not be put to death without the infliction of any pain whatever. It may be remembered that Dr. Richardson first thought his object might be attained by means of the electric shock, but after some trial it was considered that the requisite apparatus could not be brought into general use with safety. He accordingly experimented with

nitrous oxide, carbonic oxide, chloroform, methylene, carbonic acid, bisulphide of carbon, coal gas combined with chloroform—all placed the subjects in the state of insensibility. Perhaps the most satisfactory agent was a mixture of carbonic oxide and chloroform in a chamber charged with this was introduced to dogs, and all in a short time passed from death in a profound sleep without evincing consciousness. Dr. Richardson also administered the same narcotic to sheep, making them unconscious, so that they could be killed without pain; the carcasses bleeding as freely under ordinary conditions, and the meat being un-

UNCERTIFIED DEATHS.

MR. W. C. CLARKSON, the health officer of the Croydon Sanitary District, condemns in very severe terms the four deaths should have been registered in the district last year from causes 'uncertain' or 'unknown.' He thinks that it is a disgrace that such things should exist, and doubts the advisability of leaving the matter to the discretion of a coroner. The antipathy to holding *post mortem* examinations may in a measure account for it, but Mr. Clarkson confesses his inability to comprehend the system on which inquests are held. Thus, in a case where a person was found dead in a barn, with a nail driven through his head, it was decided that an inquest was superfluous, while in the case of a man who was run over by a cart, in the face of bystanders, and died from the effects of which he died, and no doubt as to the cause of death, it was necessary to have an inquest. Whether the inquest lies with the coroner or elsewhere Mr. Clarkson hesitates to say, but he very properly adds that any event the system is in obvious need of reform.

THE REGULATION OF MIDWIVES.

THE inquest held recently by Mr. Braxton Croydon into the circumstances attending the death of an infant, aged three days, once more drew attention to the danger of allowing ignorant and unskilled women to practise as midwives. In the instance a poor person had engaged a woman to attend her in her confinement, and owing to the unskilful treatment of the midwife, the child was literally allowed to bleed to death. In the evidence Dr. P. W. Perkins stated that when he was called in the child was still alive, and that the cause of death was exhaustion by hæmorrhage. All the organs were healthy, but for the want of skill displayed by the midwife there was no reason why the child should have lived. Addressing the jury, the coroner said that it was important that cases of this kind should be brought before the public, and that unskilled midwives not only very frequently sacrificed the life of an infant, but also that of the mother, and in the present circumstances they were to consider whether the midwife had not made herself amenable to criminal law. However, he took a lenient view of the case, and returned a verdict of 'Accidental death,' adding that the effect that poor people should not employ uncertified midwives, but should apply to the authorities, who will tell them whom to employ, is to be hoped that some attempt will be made during the next session of Parliament to

passing of a Bill making the examination of all women acting as midwives compulsory, and imposing a severe penalty on any person practising midwifery without having been first certified as competent.

INSANITARY WIGAN.

THE unusual prevalence of scarlatina at Wigan, and its association with overcrowding and neglect of sanitary precautions, has of late been brought into prominence by the local press; and the result of an inquiry recently held into the surroundings of a woman who suddenly died from heart disease will not tend to allay public apprehension. It was shown that for some weeks the deceased, her husband, and five children, had occupied a single room, or rather a cellar; and it was in this place that Dr. L. G. Coombs, who was called in, had to conduct a *post mortem* examination. At that time decomposition had set in, and the stench was sickening. Notwithstanding this hundreds of persons were allowed to view the body, which remained exposed on the bed in the room where the husband and five children had to sleep and take their meals during the whole of Saturday night, Sunday, and Monday morning. Decomposition increased rapidly each hour, and when the jury went to view the body on Monday afternoon the stench was intolerable, the remains not having been confined or in any way disinfected. The jury were unanimous in their condemnation of the neglect of all sanitary precautions, and made a presentment to that effect which the coroner promised should be sent to the proper quarter. The deplorable conditions here brought to light, together with the prevalence of infectious disease, the absence of adequate hospital accommodation, and the existence of grave sanitary defects, clearly show that the Town Council of Wigan have quite failed to appreciate the importance of their functions.

THE LANDING OF INFECTED RAGS.

THE Local Board of Goole have been much exercised to know how to deal satisfactorily with cargoes of rags imported from certain parts of France alleged to be free from cholera, and have appealed to the Local Government Board for their assistance. The Central Board have now replied that it is for the sanitary authority to decide whether the evidence submitted to them in any particular case is such as to satisfy them that the rags proposed to be landed in their district have not come either directly or indirectly from any place where cholera has occurred during the present year, and that they are unable to say what evidence of this kind should or should not be accepted. They remind the Goole authority that their order of August 8 prohibits the landing of all rags from France, unless it can be certified that they have not come from an infected district; and if this order is contravened, it is for them to take proceedings under the Public Health Act. Some of the members of the Goole authority think that an unfair responsibility has been thrown upon them by the Local Government Board, but it is obviously impossible for the officials at Whitehall to decide whether this or that cargo should or should not be landed. Special precautions are now being taken to prevent the landing of rags until it has been shown that they have arrived from non-infected places.

FACTORY LEGISLATION IN AUSTRIA.

A RECENTLY published Blue-book contains an important despatch from Sir A. Paget respecting the regulation of labour in the mines and manufactories of Austria. In May last a number of measures affecting the miners were adopted, the principal points of which are as follows: the actual day's work not to exceed ten hours; children under fourteen years of age not to be employed; children over fourteen and women, only by day. Sunday is to be observed as a complete day of rest. The law regulating the position of workmen in manufactories has also passed its first reading in the Chamber of Deputies, and its more important stipulations refer in the same manner to the hours of labour to be observed. The working day is not to exceed eleven hours; children under fourteen years of age are not to be employed in any regular work; and from the ages of fourteen to sixteen they are only to be employed on such light work as would have no prejudicial effect on their health. Neither women nor children are to be allowed to work at night. Sunday is also to be observed as a complete day of repose, and on Saints' days the workmen are to be allowed sufficient time to attend Divine Service. It is further stipulated that persons under eighteen years employed in the manufactories are to be allowed the requisite time for visiting the evening schools.

'INGENIOUS MALPRACTICES.'

THE sanitary and insanitary houses at the International Health Exhibition were built none too soon. Even if the fairness be questioned of making the one house glorious with dadoes, parquet flooring, and the electric light, at an expense which to the unhappy occupant of the normal suburban house would be simply prohibitive, there can be no sort of doubt as to the value of the exhibits from the point of view of a 'frightful example.' A correspondent of this journal drew attention last June (see p. 613) to the extraordinary ignorance and carelessness displayed by workmen when engaged on sanitary works. And that this is not an isolated experience, or one obtaining in the metropolis only, let the following examples, culled at random from the reports of health officers all over the country, testify. Instances of the kind are, indeed, continually being brought to light by health officers, who have much reason to complain of the deplorable manner in which the sanitary arrangements of dwellings are carried out by builders. Dr. Tripe, in a recent report on Hackney, states that when searching for the cause of periodical outbreaks of illness amongst the occupants of the first-back room of a house, he found that the hopper-head of a stack-pipe was within three inches of the window-sill, and the stack-pipe was connected with the shoulder of the soil-pipe from a water-closet, so that when the window was open the stack-pipe ventilated into the bedroom. At another house, where offensive smells occurred and illness of a low type prevailed, it was found that the bath, washhand basin, and sink-wastes were connected directly with the house-drains, and the hopper-head of a rain-water pipe communicating with the drains was within one foot of a bedroom window. At Barnsley, the wife of a tradesman living over a shop in one of the best streets of the town fell ill with erysipelas, and before she was quite well her husband began with a form of pneumonia suggestive of blood-poisoning, to which

were shortly added erysipelas and inflammation of the joints of a character respecting which there could be no mistake. At first the existence of any possible sanitary defect was denied, but on closer investigation it was found that not only were there two sinks on different floors of the house practically communicating directly with the sewer, and so ventilating the sewer into the house, but also that, by an ingeniously unsanitary arrangement, an old sink under the counter of the shop had been made to catch and detain the outflow from the sink on the first floor, and, in fact, to serve as a sort of cesspool in the house. Speaking of the way in which the old drains of Great Yarmouth have been laid, Mr. Batley, the health officer, in a recent report observes that all sorts of sizes and constructions were sometimes found in the course of one continuous drain. It was no uncommon thing to find a drain falling the wrong way; but in this fault the old ones were not peculiar. Something very like the billowy surface of the sea had been imparted to the levels of many of the drains in the town, but with the unfortunate mistake that the fall of the drain was at the top of the wave. In an old drain on the South Quay the contents had to mount up fifteen inches before they could flow out. In a house served by this drain, some deaths from diphtheria occurred a few years ago. Sanitation may not, indeed, have been understood at the time these drains were laid, but Mr. Batley points out that many drains of recent date are quite as faulty as the old ones, which is the more reprehensible inasmuch as sanitary considerations have been ruthlessly ignored, and the most culpable scamping practised. There are, he adds, modern drain-pipes ending in the sand, house-drains not long enough to reach the sewer, and ventilators only such in external appearance. Dr. Simpson, commenting on the sanitary circumstances of Aberdeen, strongly protests against the slovenly manner in which drainage pipes are laid down and jointed. Scamped work is the order of the day. Scamped work in other trades causing the death of those who depend on the work being thoroughly good and safe, brings the culpable person into considerable trouble; not so with bad drainage, though many lives are lost. This total disregard of all care by workmen is an evil of much magnitude, and it behoves every sanitary official to be on the alert to guard against the perversely unsanitary devices of the local builder. In some districts no drains are permitted to be covered in until they have been thoroughly examined by the surveyor, whilst in others the adoption and rigorous carrying out of building by-laws have led to improvement in the sanitary arrangements of dwelling-houses.

THE SANITARY ASPECT OF DYNAMITE.

MUCH has been heard of the destructive powers of dynamite, which, however, we learn from a remarkably interesting article in the *Cornhill Magazine* for September, are of a more limited nature than is generally supposed. It is, therefore, satisfactory to learn from the same source that it has a wide and useful sanitary effect. In the days of gunpowder blasting in mines, and the old ventilation, we are told, there was an excessive mortality among miners, due to a disease of the lungs known as miner's decline. It was not the ordinary tubercular consumption, but a form developed in many other callings among workers in dusty places, and variously

known as grinder's rot in Sheffield, stonemason's decline, rag-picker's disease, and wool-sorter's asthma. (A considerable amount of information in respect to these diseases will be found in Dr. J. S. Bristowe's lecture on 'Industrial Diseases,' read at the International Health Exhibition, and published in the WEEKLY EXHIBITION RECORD for July 5.) The writer of the article in question points out that since the introduction of dynamite and the common use of the nitro-glycerine compounds, there has been a marked improvement in the miners' health; for though the nitrous fumes of burnt dynamite are dangerous, with dynamite properly exploded nothing of the kind is experienced. Incidentally, an account is given of the Baker Petroleum Works, belonging to Ludwig and Robert Nobel, brothers of Alfred Nobel, the discoverer of dynamite, which seems to show that the value of petroleum for skin disease was known some centuries back, for a quotation is given from the travels of Marco Polo, in which he says, 'The oil is not good with food (certainly not!), but it is good to burn, and is also used to anoint camels that have the mange.'

EXCESSIVE DEATH-RATE FROM DIARRHŒA IN BIRMINGHAM.

SOME little consternation has been occasioned in Birmingham by the increase of the death-rate for the latter part of August to 32.9 per thousand, with a zymotic rate of 14.3. For the corresponding period last year the death-rate was a fraction over 21 per thousand. Inquiry into the cause of this startling increase over the mortality of a month previous, when it stood at about 20 per thousand, showed that of the total number of deaths (266) occurring in that borough during the week ending Aug. 23, 100 were attributable to diarrhœa. Ninety of these were children under five years of age, 60 being under one year; there was one death at the age of thirty-three, six at ages between forty and sixty, and three at sixty and upwards. Nor was the return for the ensuing week, ending Aug. 30, any more satisfactory, the death-rate being 32.2 and the zymotic rate 13.6, with ninety-four deaths from diarrhœa, of which seventy were children under twelve months old. This state of things was considered to need some inquiry, with a view to ascertaining to what the excessive deaths from diarrhœa could be attributed. The alarm occasioned only a few days previously by the reported case of Asiatic cholera which, though it has proved to be but a case of virulent diarrhœa, caused a profound sensation in the district at the time, furnished an additional reason for such action being taken by the sanitary authorities as might be required. Simultaneously with this abnormal death-rate was raised an outcry against the water supplied from the Corporation waterworks. There seems to be no room for doubt that for some days the water was of a greenish slimy character, full of green vegetation which, when subjected to critical examination, proved to be a low form of vegetable life. Analysis showed that, while chlorine and free ammonia were small in quantity, albuminoid ammonia (derived from nitrogenous organic matter) was present in an unusually large quantity, indicating vegetable contamination, and calculated to produce diarrhœa. While the albuminoid ammonia present in the water supplied by the Manchester Corporation, was 0.0078 grains per

f Edinburgh, 0'0049; and of Glasgow, Birmingham it was 0'0164. The Birmingham supply is drawn from two sources, one river supplies, and the other from wells the red sandstone at Aston, Oscott, Perry, and Selly Oak. It appears the green vegetable its origin to the supply from the latter wells. This water is stored in reservoirs in very hot weather, such, for instance, as been experiencing, when the temperature the water rises above 70 degrees, of bright green star-like particles rise from the bottom almost through the whole of the water, and form what look like moss. The only way to effectually disinfect is said to be by covering in the water, which would cost something like 30,000/.; could, no doubt, be done towards the 'vegetation' getting into the pipes at the taps by occasionally flushing the pipes during the height of disturbance this is pressed upon the authorities. But the Dr. Hill, the borough analyst, shows the quality of the Corporation water to be and continually improving, and since the hot weather disappeared there has been no complaint. With regard to the death-rate from diarrhoea, the authorities use down in great measure to the eating of tainted food, and to chills after exertion.

It has been ascertained that the man George who died (said to have been from cholera) died in the return for the week ending 1st, had for a number of days before his death been partaking freely of some tainted ham, and suffered from premonitory symptoms and they had been attended to—would in all probability have saved his life. One result of the cholera has at all events been to cause increased vigilance to be exercised by the sanitary and authorities of the town, and the highest health authorities of Birmingham has had for a very long time therefore not be without some advantage to the community at large. It may be mentioned that singular that in the mortality return for the corresponding month of 1883, twenty-two from diarrhoea included one which was re-ferred to as 'cholera.'

TEXAN FEVER AT BIRKENHEAD.

Birkenhead, on September 3, the deputy town clerk issued for an order to destroy two carcasses which had been seized at the Foreign Animals Wharf. And that on Sunday (Aug. 31) the steamer arrived in the Mersey from Boston with which she landed at Birkenhead. On inspection found that two of the beasts were suffering from Texas fever, and they were accordingly seized under section 116 of the Public Health Act. The order had been originally made on Sept. 1, but was now issued at the owners' request, in order to enable them to bring scientific evidence in proof that the carcasses were not unwholesome or unfit for food. The witnesses in support of the application were Mr. Vacher, medical officer of health, Mr. P.C. veterinary inspector, Dr. Braidwood, veterinary mile, medical officer of health for the Local Board, Mr. Dobie, Mr. Storer, and Messrs. veterinary surgeons, and Mr. Gregory,

nuisance inspector, who seized the meat. It was contended that an examination of the viscera showed that both the animals were the subjects of Texan fever. The spleens were engorged, and weighed three times the normal weight; the livers were much enlarged and softened, the kidneys were also enlarged and congested, and a quantity of serum effused around them; there were blood extravasations on the surface of the heart and into the mucous lining of the rectum, and (most characteristic of all) there were many irregularly-shaped erosions in the fourth stomachs, the floor of the erosions being black from the necrosis of the mucous coat. The carcasses did not show any special indications of disease. They were bile-stained, as was always the case in Texan fever; but bile-staining might arise from many causes, and did not necessarily render the meat unwholesome. Mr. Vacher, in cross-examination, stated that he had seen many cases of this disease since the first case which arrived in Birkenhead in August 1880. He had uniformly condemned such meat. No less than five carcasses infected thus with Texan fever, belonging to the present defendants, were seized about a month ago, and no objection was made to their being destroyed. Mr. Vacher admitted that, if thoroughly cooked, it was quite possible that such meat might be eaten with impunity. If, however, the meat were underdone, its ingestion would not be without risk, especially if the eater chanced to have a small wound in the mouth.

The witnesses for the defendant were Mr. Marsh, surgeon, member of the Liverpool Town Council, who stated that he examined both carcasses and found no signs of disease, and Dr. Imlach, who stated that he saw no indication of disease; there were no abscesses in the livers, nor any indication of lung disease. Neither of these witnesses had ever seen a case of Texan fever, and the viscera had only been examined by them on the 2nd (about fifty-four hours after the slaughter of the animals).

The stipendiary magistrate, after hearing this conflicting evidence, decided to go to the slaughterhouse and himself inspect the carcasses; and, finding the meat seemed firm to the touch and had no offensive smell, suggested that the Corporation should withdraw their application, and ultimately this was agreed to. The magistrate thought that as both sides were anxious to have a test case it would be better to wait till another seizure was made, when arrangements might be made for the scientific witnesses all seeing the viscera in a fresh state. In the present instance the medical men called for the defendants did not appear to have made their examination till the morbid appearances relied on were effaced, or partly so, by decomposition.

SANITATION AT THE HOUSES OF PARLIAMENT.

DISAGREEABLE smells having been noticed to pervade the 'House,' a select committee, consisting of Mr. W. H. Smith, Sir Lyon Playfair, Sir Joseph Pease, Mr. Giles, and Dr. Farquharson, has been appointed to inquire into the cause, and in the report it is stated that the smells complained of do not arise from any deficiency in the sanitary arrangements, and that the condition of the sewers and drains is entirely satisfactory, and reflects great credit upon the officers who are in charge of the building in their several departments. No complaints have been made as to the operation of the

system of ventilation, which appears to be entirely satisfactory; but it is clearly impossible for any method of ventilation to prevent the entrance of offensive smells which pervade the atmosphere outside the House; and from the evidence which has been brought before the committee it is clear that the smells proceed from sewer gas in the vicinity, and from some other cause, more remote, which they have not had time or opportunity fully to trace, although it is shown that these noxious objections are believed to proceed from dust heaps, the burning of refuse, and from gases emitted in the course of manufacture by factories within a distance of a few miles from the neighbourhood, and that great complaints have also been made from other parts of the west of London. It has not, however, been yet specially suggested that the condition of the Thames may have added to the prevailing nuisance, and it is quite probable that this cause may be included. Evidence has also been given that the local sewer under the control of the Westminster District Board of Works emits most offensive smells from time to time, and the committee are of opinion that steps should be taken by the local authority to put an end to a nuisance of a very serious character. It is also recommended that an officer of the Local Government Board should be directed during the recess to observe the emission of the noxious smells in the district referred to, and to take steps to trace them to their source, and the report concludes with a recommendation that the committee should be re-appointed during the next Parliamentary session to consider such further evidence as may be obtained. The present minutes of evidence so far have not been published, but we believe it is the intention so to do, and as they are likely to throw considerable light upon the subject we shall refer to it again. It may be mentioned that amongst those examined were Dr. Percy, Mr. Henry Doulton, and Sir Joseph Bazalgette, the engineer to the Metropolitan Board of Works, and we may therefore be assured that the question has been well discussed from all points of view.

THE UTILISATION OF REFUSE.

THE question of the disposal of house and street refuse is of ever-growing importance, as the more that waste land becomes restricted the nearer to our habitations are the heaps of refuse deposited, and the mischief caused by building houses on sites formerly used for this purpose is too well known to doubt. Any steps in the direction of satisfactorily disposing of or converting such poisonous material as this soon becomes, into a harmless substance is greatly to be welcomed. It has been suggested to transport such refuse to different parts of the low-lying east coast, and to saturate it with sewage, with an overflow to the sea for the more fluid portion thus created. This might be a nucleus for a large extent of grass land, but it is a question whether this process would not be a nuisance in itself, in addition to which there are no facilities existing to carry out such a scheme, and the consequent expense would be enormous. Experiments are now being made in the provinces and also near London to burn and carbonise such material as would be difficult otherwise to get rid of in an unobjectionable form. (See p. 119.) Vegetable matter is, of course, by these means easily reduced to charcoal, but road sweepings in London in wet weather contain 43 per cent.

of abraded stone and iron, and these, with other mineral substances which would be included in the general dust-heap, can be burned and ground to form a good building mortar, and from recent experiments it has in some cases been found to pay for the cost of so doing, although as a general rule it cannot be said to be a remunerative undertaking to dispose of town refuse of this description. This difficulty probably arises from the small way in which such experiments have been carried out, and it seems probable that, if conducted on a larger scale in the principal towns, a good commercial result might be obtained, more particularly if the sanitary value is taken into account as a valuable asset on the credit side.

THE ENGINEERING STAFF AT THE LOCAL GOVERNMENT BOARD.

A CAPTIOUS but well-informed correspondent sends us the following as to the composition of the Engineering Department of the Local Government Board. His remarks are too personal to be altogether fitted for our columns, but as there appears to be some truth in what he says, we print his criticisms for what they may be worth:—

I wonder if any of your readers besides myself have noticed the extraordinary frequency with which the name of Mr. John Thornhill Harrison has of late appeared in the newspapers as the inspector appointed by the Local Government Board to solve this and that other engineering problem. Apparently when the board finds itself in any specially awkward predicament in which sewage and sewage disposal are concerned, they have to fly to Mr. Harrison for advice. Certainly they could not do better; but when we learn that Mr. Harrison is to inquire into the sewerage of the Lower Thames Valley, that Mr. Harrison is to investigate the state of the Thames at the sewage outfalls, that to Mr. Harrison has been assigned the high and noble duty of tracking to their lair the effluvia that have ventured into proximity with our legislators' nostrils, one is apt to ask whether, much as we have only one general in the army, we have only one sanitary engineer in the service of the State. Probably the very moderate salary which falls to the lot of the engineering inspectors who scour the country in giving sanctions to loans, accounts for the mediocrity of the department as a whole. Honourable mention must indeed be made of the past services of its chief in the days when sanitary reform was something of a byword; but when a gentleman arrives at the age of seventy-four one begins to look upon him as past work—at any rate, such work as the occupant of this particular office is called upon to do. The other members of the staff are the brother of a well-known novelist and whilom secretary of the department, who is better known for his conversational powers than for his erudition as an engineer; an ex-secretary of a Royal Commission, remarkable chiefly for his frequent appearances in local newspapers (to-day at Exeter, to-morrow at Newcastle) in the character of an official punster; a former inspector of turnpikes in South Wales; and a couple of 'heavies'—a major and a captain—from the Royal Engineers. With colleagues such as these, Mr. Harrison's selection for the difficult and responsible duty of advising on the measures to be adopted for the purification of the river is hardly to be wondered at. If I were Mr. Harrison, which providentially I am not, I should turn faint at the bare mention of the Thames. Last year he had to conduct an inquiry into a request for a Provisional Order by the Lower Thames Valley Sewerage Board, which lasted an enormous length of time, produced 'evidence' which ran the Tichborne trial dangerously close for size and complexity, and finally ended in nothing. He has now to go over the whole of

this ground again, and to devise a scheme for the purification, not only of the upper reaches, but also for the more effectual disposal of the millions of gallons of sewage that are now daily discharged into the river at Barking and Crossness. Who will not pity him in this thirteenth labour of Hercules? The cleansing of the Augean stable was absolutely elementary in comparison.

INFANTILE MORTALITY.

At the last monthly meeting of the Gateshead Corporation the death-rate of the borough for the previous month showed an average of 30 in the 1,000 per annum, 67 out of the 169 deaths that occurred being those of children under one year old. An animated discussion took place as to the cause of this excessive infantile mortality, which was ascribed to autumnal diarrhoea to some extent. Mr. John Lucas said that it was a lamentable fact that the primary reason was that the great bulk of the people were entirely ignorant of how to rear an infant. He said they might spend some part of their time profitably in teaching the people how to bring up their children. Alderman Charlton said if they could keep women more within their own doors, and prevent them gadding about and drinking with their neighbours, he had no doubt but that it would tend to diminish this frightful infantile mortality. Mr. Councillor Parkin attributed the excessive death-rate to the common practice of feeding children with read 'boiley.' Alderman Affleck gave his opinion that the present system of ashpits was the cause of the high death-rate, and it was ultimately resolved that the Town Improvement Committee make an inquiry as to the advisability of adopting a new plan for the removal of the ashpit refuse.

THE Yeovil Town Council and Urban Sanitary Authority have determined to establish public baths, at an estimated cost of between £200 and £300.

If any one desires to vex his soul by ascertaining the exact language of the Acts of Parliament under which taxing powers are claimed by the several Metropolitan Water Companies, he may be recommended the perusal of Parliamentary return (No. 108) recently issued on the motion of Lord Silchester. The various Parliamentary enactments are given without the smallest attempt at simplification or explanation, and we fear that the return will puzzle rather than assist the untutored ratepayer. Attached to the return is a sprawling and awkward, but otherwise useful, map, showing the districts supplied by each company and its Parliamentary limits.

A CONTRIBUTION to the *Glasgow Herald* attributes the absence of over-pressure in Scotch schools—although the standard of education is high—to the superior physique of Scotch children, through their being so largely fed on oatmeal. The writer thinks it beyond dispute that no other food for children equals oatmeal. It makes bone and it takes brain, and it may, he believes it probable, give the sustaining power that enables the Scotch child to stand rain work that, under different diet, would result in strain.

THE United Operative Plumbers' Association of England and Ireland now numbers 2,349 members, being an increase of 229 on the year, and has 81 lodges in 80 shire towns, including 9 in Scotland. The society comprises the features of a trade union with those of a sick benefit and accident society, in which members' wives participate. The funds of the society now amount to 1,928*l.* or 6½*d.*, of which 1,646*l.* 5*s.* 11*d.* forms a permanent reserve fund. Liverpool contains the largest number of members, namely 141; while London, including Lewisham, figures for July 14.

THE PUBLIC HEALTH

DURING AUGUST 1884.

THE mean temperature during the month of August at the Royal Observatory, Greenwich, was 65°·3; it was 4°·5 above the average August temperature in one hundred years, and exceeded that recorded in the corresponding month of any year since 1857. An excess of temperature prevailed on twenty-three days of the month, while on the other eight days it was below the average. The warmest day of the month was the 11th, when the mean was 77°·2, and showed an excess of 14°·5; the coolest day was the 26th, when the mean was only 53°·8, and 7°·1 below the average. Rain was measured at Greenwich on eight days during the month, to the aggregate amount of only 0·7 of an inch, which was less than a third of the average August rainfall in sixty-one years. During the first eight months of this year the rainfall amounted to 11·4 inches, which was as much as 4°·4 below the average rainfall in the same period of sixty-one years. The sun was above the horizon during 449·1 hours in August, and 203·4 hours of bright sunshine were recorded at Greenwich; this amount considerably exceeded that registered in the corresponding period of any year on record. The wind was very variable throughout the month.

In the twenty-eight large English towns dealt with by the Registrar-General in his Weekly Returns, which have an estimated population of nearly eight millions and three-quarters, 22,395 births and 16,260 deaths were registered during the four weeks ending the 30th ult. The annual birth-rate, which in the three preceding months had been 35·5, 34·6, and 34·0, further declined to 33·3 during August, and was slightly below the rates recorded in the corresponding month of the two preceding years, 1882 and 1883. In these twenty-eight towns the lowest birth-rates last month were 29·1 in Huddersfield, 30·2 in Bradford, and 30·7 in Bristol; the rates ranged upwards in the other towns to 39·1 in Newcastle-upon-Tyne, 40·4 in Hull, and 44·0 in Cardiff. In London the birth-rate last month was 32·2 per 1,000, while it averaged 34·3 in the twenty-seven provincial towns.

The annual death-rate in the twenty-eight towns, which had been 19·3 and 22·8 in the two preceding months, further rose, owing principally to the increased fatality of diarrhoeal diseases, to 24·2. This rate considerably exceeded those recorded in the corresponding months of 1882 and 1883, which were 22·0 and 19·5 per 1,000 respectively. The lowest rate of mortality last month in these towns was 17·4 in Bristol. The rates in the other towns, ranged in order from the lowest, were as follow:—Derby, 19·2; Huddersfield, 19·7; London, 20·7; Brighton, 21·7; Bradford, 22·7; Birkenhead, 23·1; Plymouth, 23·7; Sunderland, 24·5; Newcastle-upon-Tyne, 25·8; Portsmouth, 26·4; Sheffield, 27·8; Hull, 27·9; Salford, 28·0; Manchester, 28·3; Oldham, 28·4; Birmingham, 28·7; Leeds, 28·7; Nottingham, 28·7; Liverpool, 28·9; Norwich, 28·9; Blackburn, 29·2; Halifax, 29·3; Cardiff, 29·5; Leicester, 30·6; Wolverhampton, 31·5; Bolton, 32·2; and the highest rate during the month, 34·3 in Preston. While the death-rate in London during August, as above stated, did not exceed 20·7 per 1,000, it averaged as much as 27·2 in the twenty-seven provincial towns. The 16,260 deaths from all causes in the twenty-eight towns during the four weeks of August included 4,593 which were referred to the principal zymotic diseases, of which 3,336 resulted from diarrhoeal diseases, 320 from measles, 289 from whooping-cough, 256 from scarlet fever, 218 from 'fever' (principally enteric), 90 from diphtheria, and 74 from small-pox. These 4,593 deaths were equal to an annual rate of 6·84 per 1,000. This zymotic rate showed a further considerable increase upon those recorded in recent months, owing to the fatal prevalence of summer diarrhoea in most of the towns; it was also much above the rate from the same diseases in the corresponding period of either of the two preceding

years. The zymotic death-rate in London during August was 4.76 per 1,000 (of which 2.85 was due to diarrhoea), while in the provincial towns it averaged as much as 8.59, of which 6.76 was due to diarrhoea. The zymotic rates in the provincial towns ranged from 3.0 in Huddersfield, 3.3 in Bristol, and 3.8 in Plymouth, to 12.2 in Leicester, 12.5 in Preston, and 12.8 in Wolverhampton.

Diarrhoea was the most fatal zymotic disease in the twenty-eight towns throughout the month of August. The rate of mortality from this disease in these towns, which had been 3.67 in July, rose to 4.97 during August, and considerably exceeded that recorded in the corresponding month of 1883, when it was only 1.90 per 1,000. The diarrhoea death-rate last month did not exceed 2.12 in Bristol, 2.27 in Huddersfield, and 2.94 in Plymouth; while it ranged upwards in the other towns to 9.35 in Birmingham, 10.62 in Preston, 11.11 in Norwich, and 11.30 in Leicester. While the rate of mortality from diarrhoea did not exceed 2.85 per 1,000 in London, it averaged as much as 6.76 in the twenty-seven provincial towns. The death-rate from measles, which had declined in the three previous months from 0.94 to 0.64 per 1,000, further fell to 0.49 during August. The rate of mortality in London from this disease was 0.43 per 1,000, and among the provincial towns the highest rates were 2.60 in Blackburn and 2.73 in Halifax. The rate of mortality from whooping-cough was equal to 0.43 per 1,000; it showed a marked further decline from the rates in recent months, and was 0.12 above the rate recorded in the corresponding period of last year. In London the death-rate from this disease was slightly below the average of the provincial towns, among which the highest rates were 0.98 in Liverpool, 1.19 in Halifax, and 1.27 in Sunderland. The rate of mortality from scarlet fever, which had been 0.35 and 0.44 per 1,000 in the two previous months, declined again during August to 0.38. The death-rate from this disease in London was 0.34 per 1,000; in the provincial towns it averaged 0.42, and showed the largest proportional fatality in Wolverhampton, Sheffield, and Cardiff. The death-rate from 'fever' (principally enteric or typhoid) showed a further increase upon that recorded in recent months, and was slightly higher in London than in the aggregate of the provincial towns. The rate of mortality from diphtheria showed a decline from the rates in recent months; the fatality of this disease was principally confined to London, where 70 of the 90 deaths in the twenty-eight towns were registered. During the four weeks of August 74 fatal cases of small-pox were registered in the twenty-eight towns, showing a further considerable decline from those returned in recent months; of these, 58 occurred in London, 6 in Sunderland, 4 in Liverpool, 3 in Sheffield, 1 in Birkenhead, 1 in Hull, and 1 in Cardiff. Judged by the returns of the Metropolitan Asylum Hospitals, the prevalence of small-pox in London showed a further considerable decline during August. The number of small-pox patients under treatment at these hospitals, which had been 1,290 and 892 at the end of the two preceding months, further fell to 539 at the end of August. The average weekly number of new patients admitted to these hospitals, which had been 275 and 151 in the two previous months, further declined to 73 during August.

The rate of infant mortality in the twenty-eight towns, measured by the proportion of deaths under one year of age to births registered, was equal to 280 per 1,000 during August, against 226 and 177 in the corresponding periods of the two preceding years, 1882 and 1883. The excessive fatality of summer diarrhoea in many of the towns caused this unusually high rate of infant mortality. While the rate did not exceed 187 and 208 in Bristol and Huddersfield, where the lowest death-rates from diarrhoea were recorded, it ranged upwards in the other towns to 416 in Preston, 421 in Brighton, and 452 in Norwich, in each of which towns diarrhoea was fatally prevalent.

The death-rate from diseases of the respiratory organs, judged by the metropolitan returns, was slightly above the

average during August. The number of deaths referred to these diseases in London averaged 172 weekly, and the annual death-rate was equal to 2.2 per 1,000. The annual rate of mortality in Liverpool from these diseases was last month equal to 2.3 per 1,000.

The causes of 386 of the 16,260 deaths registered in the twenty-eight towns during the four weeks of August were not certified, either by medical practitioners or by coroners. These uncertified deaths were equal to 2.37 per cent. of the total deaths, which exceeded the proportion in recent months. In London the percentage of uncertified deaths did not exceed 1.14, while it averaged 3.17 in the twenty-seven provincial towns; all the causes of deaths were duly certified in Norwich and in Derby throughout the month, while the largest proportions of uncertified deaths were returned in Liverpool, Oldham, and Halifax.

Among the population living in the outer ring of suburban districts around London, estimated at rather more than a million persons, the annual rate of mortality during August was equal to 20.5 per 1,000, against 17.2 and 15.4 in the corresponding periods of 1882 and 1883. During the four weeks ending the 30th inst., 346 deaths from diarrhoeal diseases, 45 from whooping-cough, 26 from small-pox, 18 from diphtheria, 15 from measles, 15 from 'fever,' and 8 from scarlet fever were recorded in the outer ring. These 473 deaths were equal to an annual rate of 5.7 per 1,000, which considerably exceeded the rate recorded in the same period of any recent year. The fatality of small-pox and diarrhoeal diseases showed a further increase, while that of measles and whooping-cough showed a decline. Of the 26 deaths from small-pox, 20 were recorded in West Ham and 6 in Edmonton.

NOTIFICATION OF INFECTIOUS DISEASE.

IN the following table are published uniform statistics of sickness and mortality in thirty of the thirty-eight urban sanitary districts in England and Scotland wherein the notification of infectious disease is compulsory. The estimated population of the thirty towns in the accompanying table, for which we are enabled to publish complete statistics for the month of August, is about two and a half millions of persons. The annual rate of mortality from all causes, per 1,000 persons estimated to be living in these towns, was equal to 23.41, against 19.53 in the preceding month. This increase in the mortality was mainly due to the greater fatality of diarrhoeal diseases. In the twenty-eight large English towns dealt with by the Registrar-General in his Weekly Returns the mean death-rate during August was equal to 24.21 per 1,000, which exceeded the rate in the towns in the accompanying table. The death-rates were considerably below the average in Aberdeen, Derby, Dundee, Greenock, Macclesfield, and Reading; while they showed a marked excess in Bolton, Jarrow, Leicester, and Preston. The high rates in each of these last-mentioned towns was principally due to the fatal prevalence of summer diarrhoea. The rate of mortality from the eight infectious diseases dealt with in the table averaged 0.54 per 1,000 in the thirty towns which furnished this information, and showed a slight decline from the rate recorded in the preceding month. No death from any of these diseases was recorded during last month in Derby, Leek, Macclesfield, Reading, and Warrington, while they caused the highest death-rates in Heywood, Rotherham, and Salford. With reference to the notified cases of infectious disease, it appears that the average proportion of the population reported to be suffering from one or other of the eight diseases was 4.07 per 1,000, against 3.86 per 1,000 in the preceding month. No case of any of these diseases was notified in Heywood during August, and only 1 in Rotherham; the proportions in the other towns ranged from 0.97 and 1.04 per 1,000 persons living in Stalybridge and Accrington, to 7.56 in Leicester, 7.75 in

Dundee, 7·78 in Salford, and 9·71 in Leek. Scarlet fever showed the greatest proportional prevalence in Jarrow, Leicester, Salford, and Dundee; enteric fever in Edinburgh, Salford, Blackburn, and Greenock; typhus in Aberdeen; and diphtheria in Dundee. Cases of small-pox were notified in Aberdeen, Birkenhead, Bolton, Bradford, Leicester, Nottingham, and Salford. Three cases of puerperal fever, and 2 deaths, were returned in Dundee.

SPECIAL REPORTS.

NEW REFUSE DESPATCH WORKS AT GLASGOW.

THIS is the second enclosure in Glasgow fitted with suitable machinery and appliances for dealing with and despatching daily, as collected, the heterogeneous refuse of the city. The objects which the Cleansing Committee of the Magistrates and Council of Glasgow have had in view in its construction are chiefly:—(1) To have each day's collection of refuse despatched to the country directly as it is brought in by the scavenging carts, and thus do away with the storing depôts in the city, which the authorities and the citizens generally have been so anxious to see abolished; and (2) to have the refuse dealt with and loaded mechanically, so that only the manurial portion, freed of all rubbish, will be sent to the farmers, while of the non-manurial portion, everything which can be sold or utilised with advantage will be turned to the best account, and the remainder reduced to inoffensive clinkers by cremation. The first work of the kind in Glasgow was started three years ago, and is constructed on the same lines, but with improvements which experience has suggested. The principle adopted in the new Refuse Despatch Works is to have refuse of all sorts carted in to the highest point, so that, without the use of elevators, the whole material is mechanically dealt with as it descends—the manurial portion being delivered into the railway waggons, the cinders in front of the boilers, other articles for use or sale—such as old iron, meat tins, old boots, &c.—to places appointed for them respectively, and all other unsaleable rubbish into cremating furnaces. The area of ground occupied (including street) is 5,100 square yards. The machinery house proper is a substantial three-storey building, 117 feet by 91 feet. All the carts on entering the gatehouse pass on to the weigh-bridge, and are weighed by the gateman. Any material—such as stable manure, which requires no manipulation—is carted straight into the middle floor, where closed hatches are provided for simply shooting it into the railway waggons. All the general city refuse, which is composed of—(1) contents of ashpits and bins, (2) excreta, and (3) street sweepings, is taken to the top floor, where special provision is made for each variety. The contents of ashpits and bins—these forming, of course, much the largest quantity—are shot into revolving screens of new design, erected close under the girders. Each screen (making fourteen revolutions per minute) has a double action, and although in one piece is practically a screen within a screen. By the first action upon the inner mesh, sloping from west to east, all the rougher rubbish—which will not pass through a $1\frac{1}{4}$ inch opening—is separated and delivered on to a travelling carrier at the east end of the screen; and by the second action upon the outer mesh, sloping in the opposite direction, the material which has passed through the inner mesh travels back over the $\frac{1}{2}$ -inch outer mesh. The material—chiefly cinder—which passes over this $\frac{1}{2}$ -inch mesh is delivered at the opposite end of the screen from the rubbish, and is thereafter passed down a shoot to the front of the boilers, where it is used as fuel, and serves to raise steam for the works. The fine ash and small manurial particles fall through both meshes of the screen and thence down a shoot into mixing machines, which stand upon an elevated platform on the floor immediately below. Into these mixers there passes at the same time a mechani-

cally regulated quantity of excreta. The cart in which this material is collected also ascends to the floor, where the contents are passed through glass closed cast-iron tanks, which rest on the second floor from which, by a simple mechanical arrangement, desired supply is allowed to escape into the mixer with the fine ash, which absorbs and deodorises the ammonia and further deodorises the manure. Provision is made for adding sulphur or other disinfectant or deodorant to the excreta in the mixer. The other material which is shot into the mixer is the consolidated detritus from the paved streets &c. In our wet climate this is frequently collected in a very slushy condition and in large quantities. Sloppy sweepings are also carted to the top floor, where provision is made for having them shot through openings near the gables into large cast-iron draining tanks of novel construction and designed for this purpose. They have sloping bottoms provided with apparatus for draining off the water pressed to the surface. When the contents are drained the large doors in the front are gradually opened by means of chain barrels and worm gear, and the material, which is pulpy and rich looking, is shot down into the mixers. Thus the various manurial portions of the refuse are passed in regulated quantities into mixing machines, whose revolving blades throw the whole into a deodorised compound, which is shot into the railway waggons direct, and the material is supplied with a prepared manure in good condition for spreading on the land. The rough rubbish, as observed, is delivered by the inner screen on to the travelling carrier. This is an endless web of iron plates supported by chains, which is made to travel 30 feet per minute. Women are stationed in front of it to pick off what can be sold or utilised. One picks off what is manurial, such as dirty straw, pulpy material, &c., and this garbage she drops down by her side into the waggon direct, where it is mixed with the compound as it comes from the mixer. Materials picked off for use are old iron, old tins, rags, paper, &c. The remainder is shot down the carrier into a specially constructed cremating furnace, where it is reduced to clinkers, which are, of course, sold to the brickworks, and, like common furnace ashes, go to make up ground. The various articles of salvage are mostly sold to persons who can make use of them. Old iron goes for precipitating copper; ammunition is extracted from old boots; solder is taken from the remains of old cartridges, and so on. The scrapings of macadamised roads are not mixed into the prepared manure for sale, but material is drained separately at the south end of the works and despatched by itself to the reclaimed farm at Moss, for the improvement of which it is used. There are four sets of rails running inside the building, with a traverser at the north end for shifting waggon from the one set to the other; and provision is made for all the traversing and haulage by steam-power. The erection of the works special attention has been given to the question of ventilation. A very large fan, driven by a separate 30 horse-power engine, and capable of moving 29,000 cubic feet of air per minute, is made to draw constantly from the soil and mixing chambers, and blow the vitiated air through large pipes leading to the ashpits of the cremating furnaces, thus supplying them with air under a slight pressure. This is a thorough way of dealing with it, and of getting rid of the nuisance outside the building. For light and ventilation a large opening or well, 31 feet by 11 feet, is left near the centre of the building, immediately in front of the cremating furnaces. A large bell-mouth, 10 feet in diameter, is hung from the roof over this well, and connected by a 3-foot sheet-iron flue to an annular space in the roof. This draws off the vapours which are the process of cooling the red hot clinkers within the furnaces and boilers, thus keeping the bu-

ar from sweating. The chimney is 250 feet in 20 feet diameter at the base, and 10 feet diameter top. Steam at 60 lbs. pressure is raised by means under fuel in two Lancashire boilers of 50 horse-power. The machinery—all in duplicate—is driven by high-pressure coupled horizontal engine capable of doing 80 horse-power. The cleanliness and comfort of the workpeople of both have not been forgotten, suitable lavatories and having been provided for them, and also messrooms for necessary cooking and heating conveniences. A house has also been made for the district carting department of the department on the same piece of land by making stabling accommodation for thirty-four and their harness, with the necessary cooking and arrangements. Under the stables, which are raised on work and approached by an inclined gangway, are large storage-sheds for carts and other vehicles, and in the small open yard in front of these provision is made for hose-washing the carts as they go in. Over the stables there are commodious straw lofts, and close to the gatehouse there are g-houses for the works manager and the carting respectively. The works have been planned, their erection supervised, under the cleansing committee by Mr. Young, inspector of cleansing, and his staff.

A luncheon given on the opening of these works, the report of Glasgow stated that the cleansing department had 163 miles of streets and roads to cleanse, and 700 tons of all manner of refuse were cleared daily. Last year the refuse of the city was sold to customers, scattered over no fewer than sixteen parishes. The Cleansing Committee had made a farm out of bog, and it was now paying in crop. They employed between 800 and 900 men, including almost all the tradesmen, and owned 180 horses. Mr. Young and his officials passed upwards of 100,000 lbs. of their hands annually, exclusive of what had been cleared in the new works.

REVIEWS.

EXHIBITION HANDBOOKS.

Unhealthy Houses in Town and Country. By W. Eassie, C.E., F.L.S., F.G.S., &c. With Appendix by Rogers Field, B.A., M.Inst.C.E. Illustrated. London: Clowes & Sons.

Formerly, aspect and geological conditions of site were supposed to constitute the main essentials for determining whether a house could be rendered healthy or the reverse; so, recently, have these points been almost entirely, and attention has been transferred to the question of 'immediate house-drains,' and therein are supposed to lie the main facts. As usual, the mean between extremes is nearest the truth, and although there are technical works bearing upon the subject, we are able to find that aspect, subsoil, distribution of air, and ventilation are not lost sight of in this concise and useful manual. Coming under the heading of a highly practical work, it is unusually free from conical terms, and, though it may be read with advantage by sanitarians, it still is written in such a way as to be understood of the people.

The author's freedom from unpractical theory is apparent from the beginning, where it is admitted that fairly good sites can be provided upon any of the geological formations, otherwise it would be a very serious matter for us to have no choice, and this inability to choose, we are in the position of the majority of people. Attention is called to the curious fact that the earliest civilisation on our island chose the outcroppings of only certain geological formations to almost the entire repudiation of. In the eastern part of Northumberland the ancient

villages and hamlets were built only upon certain isolated areas of a certain sandstone. Out of twenty-three villages, thirteen were built upon rock, six upon sand, and only one upon the clay. It has also been pointed out that no less than nineteen of the largest and most important towns in England, from Exeter to Carlisle, are all situated along the line of one geological formation, the new red sandstone. Most people prefer gravel for a subsoil, and rightly so, provided that the gravel is sufficiently extended to allow of natural drainage and percolation, otherwise, if the area of gravel is limited, or not deep enough, its absorbent properties will produce ill effects if an under stratum of impermeable clay or rock should form a barrier to drainage, and in preference to this the author recommends building upon a hard clay, making provision against damp and stagnation by means of concrete and draining.

The evil of damp walls arising from the want of a damp course is also adverted to, and the usual plan of putting a 'dry area' between the house wall and the earth is advised; but for the damp course we must take exception to the use of slates bedded in cement, or even the special made tiles; the slates, particularly, are very unsatisfactory for this purpose, they crack at the inevitable settling of a new wall, and thus add to the already too numerous joints. A good layer of asphalt is the best for this purpose, and where this cannot be readily obtained (as is often the case in the country and for small works), the best plan is to use a damp course of sheet lead, which possesses the advantages without the disadvantages of the other methods. The many insanitary points of construction and arrangement well known to professional men are taken in order, and the main portion of the work is devoted to the house-drains and connections. These are treated of very fully and impartially, and lead naturally to the 'Appendix' on *The Water Supply and Disposal of Sewage of Country Houses*, by Mr. Rogers Field. In a comparatively short space the first question is clearly dealt with, the sources of supply, rainfall, springs, and wells are taken *seriatim*, and useful notes and memoranda are given. There is a point mentioned to which attention might more frequently be drawn with advantage, viz., that 'rain water, on account of its softness, frequently has a strong action on lead, and that leaden pipes and cisterns should therefore never be used in connection with it. The best material to use for the pipes is iron, or, in some instances, 'lead-encased block tin pipe,' in which the tin is not a mere coating, but of a sufficient thickness to protect the lead satisfactorily. This latter point is of the utmost importance, as, if the tin were perforated or broken through, the danger of the lead being acted on would be increased in consequence of galvanic action being set up. The expense of this tin-lined pipe is, unfortunately, against its general use; it costs half as much again as the ordinary lead description, and is much more difficult to work.

The sewage distribution is discussed from all sides, and its disposition over the land in small quantities points to a sensible conclusion.

The 'get up' of these Exhibition handbooks is scarcely distinguishable from the catalogues, and, as they are well illustrated, they should become useful references; as such they are entitled to a permanent binding, by means of which they can be preserved, otherwise they are apt to lose the covering title-page, and with it they lose their identity and become lost among pamphlets or even unwittingly are allowed to drift into the waste-paper basket.

Health in the Workshop. By James B. Lakeman, H.M.'s Senior Metropolitan Inspector of Factories, Home Office. London: Clowes & Sons.

If the majority of operatives are unacquainted with the history of factory legislation, it can scarcely be expected that the public should have much knowledge of the subject, and to make us acquainted with the present extensive safeguards of the health and physical protection of the workers, Mr. Lakeman traces the Acts and results from

the time 'when George III. was king' to the year of grace 1883. Starting in 1802 with 'small beginnings and modest phrases with gentle interference,' we find that fresh Acts and amendments were gradually introduced until at last they control or regulate every industry great or small. The first Act related mainly to the wants of apprentices as to clothing, cleanliness, and ventilation; time for work and meals was regulated, and their morals cared for. The principles of religion were duly instilled once a week, and every apprentice was to receive the Sacrament before he attained his eighteenth year. These provisions apparently were not fully carried out, and after a time the increasing number of factories and fresh industries gave rise to further evils, and in 1833 the second Act was passed with wider powers and scope, but morals in this case were not mentioned, as there was so much cruelty and iniquity to be overcome before morality or religion could receive consideration. In another ten years it was necessary to introduce further regulations, and the safety of life and limb from machinery had to be provided for. In 1846 the Print Works Act was passed, as it was shown that children were made to work at the age even of five years, and that too for fourteen hours a day in a temperature sometimes reaching 110° Fahr. In 1848 the working hours were reduced to ten per day, but ten consecutive hours were allowed, commencing at any time, so that night work was not excluded. These rules being evaded, it was enacted that young people and children's time should be limited from six in the morning to six at night, and to two in the afternoon on Saturdays, meal times being also noticed. It will be seen that up to this time, a period of fifty years, the welfare of children and females in textile factories only was considered, but from 1860 to the present time various new Acts, and the repeal of some of the former ones spread the meshes of the inspectors' net in such a way as to reach nearly all for whom legislation in this direction is required. Lace-making having assumed such importance in 1861, a special Act was passed to bring this industry under the then existing Factories Acts. At that time 150,000 persons were engaged in its manufacture, between 8,000 and 10,000 being children and young persons. Youths between sixteen and eighteen years of age were allowed to work between four in the morning and ten at night, but for nine hours only.

This being a strictly practical work, no attempt is made to refer to the history of any industry, but it may be of interest to many of our readers to remind them that this was not the first time that the Government had the question of lace brought before them, but of course from a different standpoint. In the sixteenth century this delicate fabric was made in England and all over the Continent by nuns and members of wealthy families, and in 1662 the English Parliament, alarmed at the sums of money sent out of the country for the purchase of foreign lace, prohibited its importation. The English lace merchants, at a loss how to supply the Brussels lace required at the court of King Charles II., bought up all the choicest lace in Brussels and smuggled it over to England. The contrast is curious, both in legislative and other points of view.

The impartiality of the enactments is shown by the passing of the Exemption Act in 1871, in favour of the Sunday employment for Jews, otherwise they would be limited to four full working days a week.

The condition of many of the metropolitan bakehouses was made known in 1881, and it will be remembered that terrible facts were disclosed; therefore in 1883 an amended Act was passed to bring them under the necessary inspection, with, it is needless to say, good results.

Part II. deals with accidents, their causes, and extent, and very extensive they appear to be, notwithstanding the many precautions taken to avoid them, but it must be said that the carelessness of the operatives renders many of the safeguards useless, and those who are accustomed to deal with large numbers of men are well aware of this fact.

Part III. deals with the sanitation of factories and work-

shops, and the methods used to prevent the ill-carrying on injurious and noxious trades. The are far too numerous to mention, but a short study to the book will show how necessary it is to those who cannot help themselves; it will also be well they are looked after, and how many are saved the wheels of the industrial juggernaut. Vented in Part IV., and the question of cubic space are told, not yet satisfactorily settled, owing to the involved; but otherwise the temperature and clean the atmosphere can be fairly maintained, and this point, considering the many evils to be overcome, the subject generally has been well considered before us in an interesting way, it would have a great advantage to the general reader to have a few more illustrations to refer to, particularly in section.

A Manual of Ventilation, Warming, and Lighting.
Capt. DOUGLAS GALTON, C.B., F.R.S. Ill.
London: Clowes & Sons.

WITH many people the word 'ventilation' opening the windows and sitting in a draught, and the poorer classes it implies increased cold and The object of this manual is to add to the knowledge of how to obtain fresh air and warmth suffering from the many disadvantages usual in so doing. It is hardly to be expected much fresh information can be given upon a subject which has already been well 'ventilated,' theory and practice are well described, and the improvements to date show that the question has consistently elaborated. The majority of works description insist that the public *shall* carry out the and it is assumed that the public possess the means to do so, but in the example before us we what *can* and *may* be done. Again, the difficulty constantly ignored as to the adaptation of new plans to old buildings. It is all very well to talk of a separate flue for carrying off the vitiated air, becomes an expensive task in the ordinary way, in building a new house this can be done at very expense or trouble; it is, therefore, a relief to be and not hectoring, in addition to which the 'sua modo' is more likely to be effective in result. Be mind that these handbooks are intended for an nical audience and to remove erroneous impressions must expect reference to known facts, and we are prised to be reminded that fogs must from their nature constantly recur. It is a highly popular belief they are peculiar to London, but we have knowledge of the atmosphere in Paris and elsewhere, not so thick black to be sure, but accompanied with a coldness paralleled intensity.

'Fog appears to be formed by the condensation aqueous vapour in the atmosphere upon any solid which may be at hand. The formation of fog, it depends in the first place upon the presence of vapour, and in the next place upon the dust particles in the atmosphere. If there were no dust there would be no fog or rain, but the aqueous vapour would condense upon the trees or houses or our clothes. Fog is therefore, only produced when there is abundant dust nuclei and plenty of vapour, and we find ammonia (which exists largely in connection with life) and the products of combustion of the fuel coal, appear to have a similar affinity for vapour.

'It is thus evident that all fires, however perfect combustion, are fog-producers when accompanied certain conditions of moisture and temperature, and combustion, under all conditions, is bad as a fog-producer. It is hopeless then to expect that by adopting fires a perfect combustion—such as gas fires, now so advocated—we would thereby diminish the fogs which presently envelope our towns.'

es Captain Galton point a moral and adorn a tale an two cities. Prevention, we know, is better but, being unable to prevent, suggestions are he amelioration of existing conditions, and the nployed are clearly defined by ample illustra-figures.

fort the open fireplace is not to be denied, and merits and demerits of the various systems are and comparisons with gas fires are given, and periments made for the Smoke Abatement Com-appears that to maintain 1° F. rise of temperature coal costs about one-third the price of gas.

e who are obliged to burn the midnight oil, or business or pleasure (are they not sometimes), the chapter on lighting will be full of interest, as it does the results of experiments in all

Another popular error as to the heating pro-gas and candles or lamps is dispelled, as

mplain of gas, but if we were satisfied with the nt of light in the case of gas which we obtain es or lamps, and if we took care that all the z through the burner was thoroughly consumed, not find the vitiation of the air more incon-th one than with the other. If persons, when ndles, would increase the number of the candles ual the light of the gas-flame, the heat given be found to be less when burning gas than ing lamps or candles. It has, indeed, been experiment that the combustion of colza oil nearly twice as much heat as the flame of of the same standard of luminosity, and that son with ordinary thirteen sperm-candle gas the ate amounts of heat are as 78 to 68.'

constantly overlooked is the use of reflectors.

and economise daylight, why not adopt the is to show the rays of artificial light where we re them? It is quite an exception to do so. nciples of and suggestions for electric lighting urnished in a way to induce the multitude to ore knowledge of a subject which is of greater : to them individually than they care to admit.

Hints on House Drainage. By a Clerk of Works.
London: Boot & Son.

r of this pamphlet starts with the assertion that inage is a matter which does not generally re-ient attention from builders and others to whom nary to entrust this important branch of house n, there being often a lamentable lack of super-: the laying and fixing of these indispensable s and traps.' As affecting the ordinary builder oubtfully only too true; but these remarks can said to apply to the 'others' who carry out this when the arrangement of the drainage is taken ilder's hands, it implies that it is undertaken ent sanitarians or sanitary engineers, and then be carried out almost too carefully to suit the the average householder, as in the concluding as it is stated that simplicity, combined with emanship and materials, should be studied in to any complicated arrangements, which often re attention to keep them in order than they are to get. There is a good deal of truth in this ent, and it behoves the owner to adopt, if pos-tem as simple as is consistent with safety, as in e the work should not be allowed to get out of use no one else about the place can understand d wherefore. Attention is also called to the ater-traps, though eminently useful, must not pon by themselves to keep back sewer-gas, and nents and tests from 'Blackie's Encyclopædia' to prove the affinity of such gases for water. it needless to say that ventilation of the pipes

and traps is recommended, so that the foul air can be dis-perped as soon as generated. The fallacy of depending upon disinfectants is likewise adverted to, for, although they are useful in their way, they are, with some excep-tions, more likely to disguise than to destroy. To sprinkle chloride of lime was formerly considered by the general public to be sufficient to meet all sanitary require-ments, or the occasional use of permanganate of potash was supposed to be highly efficacious under all circum-stances; it is, therefore, very necessary to point out that such remedies are but partial.

These 'Hints,' so far as they go, are certainly sensible and practical, but they are not sufficiently ex-ended to be of much use beyond suggesting a further inquiry on the part of the unprofessional reader; for instance, the follow-ing paragraph would not convey much idea to those with-out sanitary knowledge. 'The outlet into sewer should be provided with a proper tidal flap, and the length of drain between the syphon and sewer ventilated.' These generalities tend to arouse a further interest which is grow-ing fast among all classes, and as such they are no doubt useful, as when an interest is thus fairly awakened, there is no lack of fully illustrated works to expound the subject more clearly. The pamphlet concludes with a recom-mendation that a complete plan of all drains and their connections should be attached to the title-deeds of every house. This is a point too often neglected, and the omission of so doing is the more to be reprobated when the great saving of eventual trouble and expense is taken into account. In most houses of importance there is usually a coachman or gardener who has an intelligent knowledge of the way the house-drains run, but, failing this source of information, it often becomes a matter of serious consideration how to trace the various courses. It is always advisable to have a properly prepared plan of the system mounted and varnished and hung up for reference in an easily accessible place; the trouble is not much in the first instance, and, sooner or later, is of great advan-tage.

Hygiene: its Scope, its Progress, and its Leading Aims, and Health and Social Science. Two Addresses delivered before the American Public Health Association by the President, EZRA HUNT, M.D., M.A., D.Sc.

If translated into vernacular English, one might find some instruction in these pages, or at least matter for reflection as to the spirit in which the study of hygiene should be pursued, the dangers of one-sided speculation, or the premature popularisation of scientific hypotheses, and the perversity of public bodies willing enough to spend money in endeavours to repress epidemics, but nig-gard in their expenditure for their prevention or for the furtherance of research.

But to wade through page after page of inflated and stilted expressions, of sentences that take away one's breath, and words the meaning of which one has to guess, though endurable in authors of undoubted genius, as Carlyle and Emerson, is extremely wearisome in their feeble imitators.

The almost invariable misspelling of French and German names, and of words derived from Greek and Latin, which we have frequently had to animadvert on in American literature, suggests unfavourable reflections as to the intrinsic value of the degrees in arts, medicine, and science (for a wonder a professor and editor is not also LL.D.) which Dr. Hunt appends to his name.

One sentence, by no means an extreme example, but selected as a complete whole, may serve to illustrate the author's style:—'So sure as the reign of law is the grand fidelity and constancy that pervades the universe of God, and forms the nexus of which all human law, called government, is but a copy or an attribute, so sure is it that we must find out and follow out in the individual and social life those laws of health which pertain to the compact not less than to the individual.'

Elementary Physiology adapted to the Syllabus of the Education Department. By G. T. BETTANY, M.A. (Cant.), B.Sc.(Lond.). London and Derby: Bemrose & Sons. 12mo., pp. 160.

THE introduction of physiology as a 'specific subject' into the curriculum of elementary schools is calculated to be of no small value to teachers and pupils, and the knowledge thus acquired is of at least as great practical importance as that of physical geography or political economy. But the difficulty has been to divest the teaching of technicalities and to bring it really within the comprehension of children of average intelligence. As a small work on physiology Huxley's is perfect, but it requires, if not a scientific education, at least a degree of mental training and intelligence which we cannot expect to find in the ordinary boy. Mr. Bettany has completely overcome the difficulty, and produced the only book on physiology which is quite within the comprehension of children and yet is sound and trustworthy and free from everything like 'twaddle.' Following English usage he devotes at least half the work to what Germans would call anatomy rather than physiology, and since his physiology is professedly elementary he does not enter into such questions as metabolism and the production of heat and force, or the higher phenomena of the nervous system, as inhibition and the controlling functions of the cerebral centres. But so far as he goes his work leaves nothing to be desired on the score of scientific accuracy or simplicity of language, and each chapter is followed by questions and illustrations or experiments, not of the nature of vivisection, but enough to give a practical character to the teaching.

Hygiene: a Manual of Personal and Public Health. By ARTHUR NEWSHOLME, M.D.(Lond.) Pp. 400.

Hygiene, or the Principles of Health. By JOHN PILLEY, F.C.S. Pp. 174. Geo. Gill & Co., Warwick Lane.

THE recent addition of hygiene to the list of subjects in which examinations are held and certificates are given by the Science and Art Department has led, and will doubtless for some time lead to the production of a number of text-books of various degrees of merit. Dr. Newsholme's is by far the best we have yet seen; the author's degree is a guarantee of the extent and accuracy of his scientific and medical knowledge, but he has the gift of expressing himself in clear, concise, and at the same time attractive language; indeed, we are really surprised at the mass of facts and information he has succeeded in compressing into the limit of a very modest volume. We cannot, however, help thinking that, in common with all writers on dietetics, he places too much reliance on the estimates of potential energy contained in different foods, founded on the chemical theories of Playfair and Frankland, but recently called in question by the Munich School of Physiologists. Metabolism is not identical with combustion; it is oxidation, but oxidation accompanied by complex and diverse collateral phenomena of splitting up, combination, and storage in the organism, besides being mostly incomplete. We much doubt whether the value of fat is so much higher than that of the carbohydrates as Frankland teaches; in fact, we believe that it is nearer $1\frac{1}{2}$ than $2\frac{1}{2}$ to 1.

Again there is abundant and positive evidence of the direct conversion of proteids into fat, simultaneously with the metabolism of the other moiety into urea, whereas considerable doubt has been thrown on the formation of fat from non-nitrogenous food-stuffs, which may rather lead indirectly to its formation from the proteids. Too little is known of the vital processes in insects to justify referring, as Dr. Newsholme does, to Milne Edwards's observations on bees; while the example of the Strasburg geese rather supports the proteid view, since their fat is obviously derived mainly, if not wholly, from diminished oxidation and fatty degeneration of the nitrogenous tissues.

Dr. Newsholme, following Blondeau, quotes the

'ripening' of cheese as an instance of the conversion of albumen into fat; this view is certainly erroneous; change takes place only in the living organism; increased percentage of fat is due, as Alex. & Sieber have shown, to the loss of water, and is, apparently not real.

His statement that barley and maize contain 'gluten' is likely to be misunderstood; he no doubt means what he elsewhere calls 'glutin,' viz., vegetable mucidin of some chemists, which gives to wheat and rye-flour the tenacity that renders them capable of being made into bread.

The chapter on the prevention of infectious diseases is admirable: the author rightly describes cow-pox, modified by passage through the bovine system, and not as the French school still maintain, as evidence to the contrary, as a spontaneous animal disease; but he is, perhaps, too sanguine as to the application of the 'cultivation' theory in the face of the signal failure of Pasteur's 'vaccines' where and how they have been tried by others—even by his countrymen abroad.

The book, however, is excellent as a whole, as regards the amount of information, the detail and absence of padding of any kind, the consistency of the author's views on every subject, and the might almost say elegance, of his style.

Though not so described on the title-page, from the contents that Mr. Pilley's book is intended to meet the requirements of candidates in elementary stage. The physiology is not, however, of the present state of our knowledge. Thus nitrogen is everywhere described as flesh-forming, tissue-forming, and so forth, but there is not the remotest allusion to their influence in accelerating metabolism with Pectenkofer and Voit among others have shown them, if in relative excess, tissue wasters; and what principle on which Bantingism is based. Nor do Pilley refer anywhere to the indisputable production of proteids which rests on clearer experimental evidence than the direct conversion of carbohydrate into fat.

Speaking of lime salts Mr. Pilley says, 'When given to young children is deficient in these salts rickets frequently result.' Whereas, though the bones may be deficient in earthy matter there is no evidence that the disease is ever produced in them; it is improper feeding, no doubt, in most cases; but quite irrespective of the amount of lime, remedy is so useful as cod-liver oil, which improves nutrition, though certainly not from containing lime.

Mr. Pilley commits himself to a sweeping condemnation of condensed milk for infants as inferior to pure milk to the comparatively small quantity (?) of saline. A somewhat extensive experience has satisfied us that very young infants, at any rate, thrive as well on better on condensed than on fresh cows' milk; besides the fact that the latter is as deficient in sugar as the former is the reverse, the casein in the condensed is easily digested than it is in the fresh, and the whey, like that of asses' versus cows' milk, is one of greater capability of assimilation than of chemical composition.

The carbonic acid in water, in virtue of which it solves calcium carbonate, is repeatedly stated to be from the air. As a matter of fact the quantity of carbonic acid by rain as it falls is extremely small, certainly not more than 0.006 of its volume. The great source of the spring water is the ground air, the existence of which Mr. Pilley ignores altogether, which contains never less than 6, or 8 per cent. of its volume, and may contain as 20 or 30 per cent., while the atmosphere has but 0.03 per cent. The sanitary bearings of this fact are of the greatest importance.

In the chapter on parasites the author refers to reports of fatal trichinosis from eating American pork, and the recent prohibition of its importation into France.

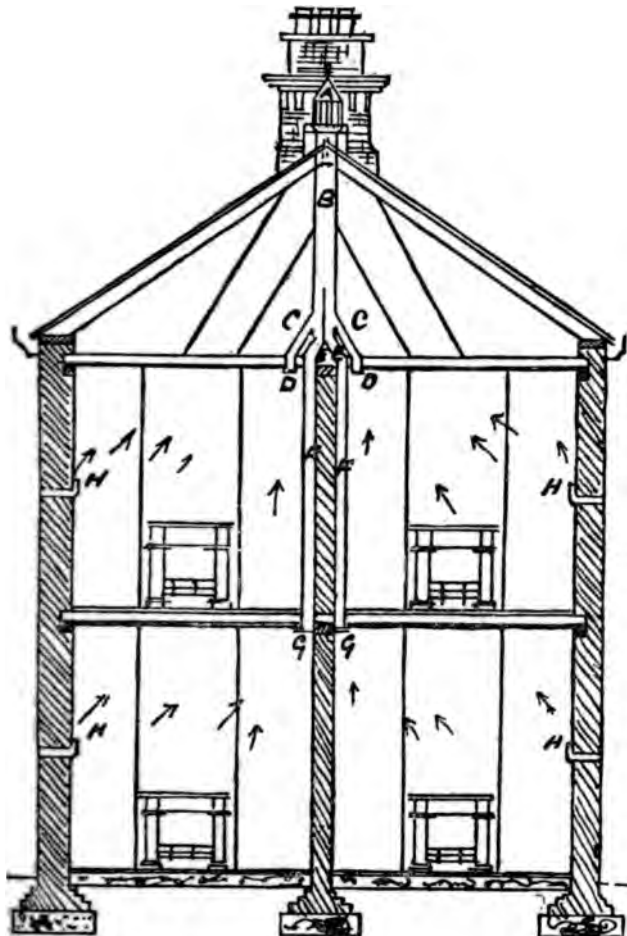
mentioning the protests of all the leaders of the medical profession in that country on the ground that no such cases ever been heard of; an opinion likewise expressed by the highest authorities in Germany, the trichina in American pork being always dead or nearly so. Every German epidemic has been caused by the consumption of home-fed pork, raw or half cooked; the same is true of Sweden and Asia; indeed the only instance in this country was led by the imperfectly cooked flesh of a pig born and bred in Cheshire.

NEW INVENTIONS.

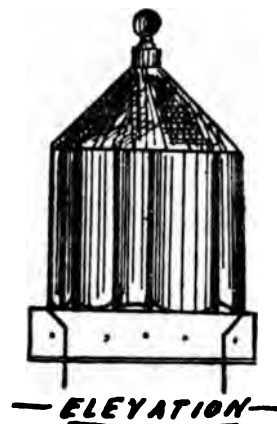
VERY CHEAP VENTILATION FOR WORKMEN'S HOUSES, INDUSTRIAL DWELLINGS, &c.

is an automatic exhaust roof ventilator, 10 inches in diameter, with an 8-inch shaft, on Stafford's principle, provisional specification No. 3,216, October 21, 1863, which is free from down draught as any automatic ventilator of its class, and possesses the advantage of carrying a shaft

up by openings 4 inches in diameter in the angles of the first-floor rooms at the points marked D D. From the junction of C C the main shaft divides into two 4-inch shafts E E, which penetrate the ceiling in the angle of the first-floor room, but inside the outlet D. This angle is closed in from the ceiling to the floor below by a 7-inch board, or a strip of galvanised iron, let into the wall on either side F F, thus forming a continuous shaft from the 4-inch G.I. pipe E E, and is connected through the floor and ceiling at point G G with the ground-floor rooms. This provides for a simple system of outlet, all the shafts of which are vertical, or nearly so, and thereby avoids the condensation and tendency to back draught inevitable with horizontal pipes, or pipes having only a slight rise. H H H H are four inlet brackets, 11 inch by 6 inch by 2 inch. These inlets are fixed at the opposite side of the rooms to which the outlets C and G are fixed. The Æolus Waterspray General Ventilating Company, 225 High Holborn, W.C., supply the above—viz., one 10-inch Stafford's exhaust roof ventilator, with 8-inch pipe, two 4-inch branches, one double 4-inch branch, four 10 feet lengths of 4-inch by 7-inch matchboarding or galvanised



—SECTION THROUGH HOUSE—

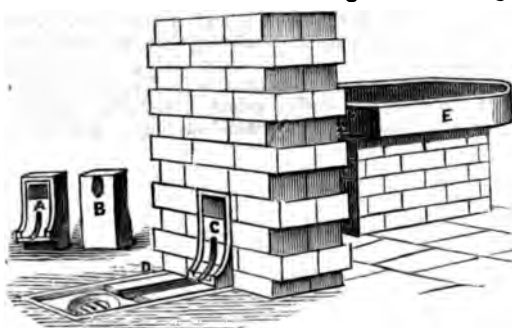


only as large as the head, the extracting power of any properly constructed roof ventilator lying in the diameter of the shaft which it is able to carry, and not in the size of the head. B is the 8-inch main shaft, which descends to within 2 feet of the ceiling of the upper room, and there receives the two 4-inch outlet pipes C C, which communi-

cate by openings 4 inches in diameter in the angles of the first-floor rooms at the points marked D D. From the junction of C C the main shaft divides into two 4-inch shafts E E, which penetrate the ceiling in the angle of the first-floor room, but inside the outlet D. This angle is closed in from the ceiling to the floor below by a 7-inch board, or a strip of galvanised iron, let into the wall on either side F F, thus forming a continuous shaft from the 4-inch G.I. pipe E E, and is connected through the floor and ceiling at point G G with the ground-floor rooms. This provides for a simple system of outlet, all the shafts of which are vertical, or nearly so, and thereby avoids the condensation and tendency to back draught inevitable with horizontal pipes, or pipes having only a slight rise. H H H H are four inlet brackets, 11 inch by 6 inch by 2 inch. These inlets are fixed at the opposite side of the rooms to which the outlets C and G are fixed. The Æolus Waterspray General Ventilating Company, 225 High Holborn, W.C., supply the above—viz., one 10-inch Stafford's exhaust roof ventilator, with 8-inch pipe, two 4-inch branches, one double 4-inch branch, four 10 feet lengths of 4-inch by 7-inch matchboarding or galvanised

PATENT SLOP-STONE WASTE-PIPE PROTECTOR.

THIS is a small, cheap, and useful invention, intended to obviate the unsightly lead or other pipe protruding through the wall from the sink, and to regulate the flow of the water to the grid, and prevent splashing, or the water getting into the foundation of the wall. It consists, as the accompanying drawing will show, of a salt-glazed fire-clay block, 12 inches long, 6 inches broad, and $4\frac{1}{2}$ inches thick, of which A and B in the small illustrations are the front and back views. C shows the block built into the wall, behind which is the sink or slop-stone E. The waste-pipe from this is passed through the wall in the usual way, and inserted about 2 inches into the hole, as shown on B, and the water then runs on to the dished grid D. Although



any shaped grid will of course answer the purpose, the one devised by the inventor of the protector, and shown in the illustration, is of excellent design, is made in two sizes, and enables the gully to be placed at least 18 inches from the wall, enabling the recommendation of the Local Government Board to be complied with, and preventing any smell that may arise from the gully passing back into the house through the slop-stone pipe. Besides making the arrangements for carrying off waste water complete, and rendering the surroundings neater and more cleanly, it saves one foot of lead pipe in each case where it is used, and prevents any damage to or incentive to steal it. The protectors are being extensively used in the Lancashire district, and only require to be generally known to be largely adopted, their very small cost being an additional recommendation. Further information can be obtained of the proprietors, Messrs. T. Griffiths & Son, builders' merchants, 84 Chorlton Road, Manchester.

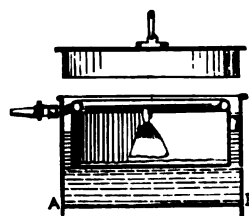
GIBBS'S CONCENTRATED CARBOLATED CREOSOTE.

THIS is a cheap and valuable disinfectant, introduced by Messrs. D. & W. Gibbs, of the City Soap Works, E.C., and Abbey Chemical Works, Stratford, E. It is a mixture of carbolic acid and other disinfecting bodies, equally powerful as antiseptics, with the addition of the oils of creosote. It probably contains more disinfectants in its composition than any other compound of the kind now in use, is as efficacious as the most costly, is more agreeable, not so dangerous as carbolic acid when used alone, and costs less than 2d. per gallon. Apart from the ordinary disinfecting uses, a small quantity (about a tablespoonful) added to the bath will be found very refreshing, and mixed with the water in a laundry in the proportion of a half-pint to 25 gallons of water, its beneficial effects will soon be experienced. It will be found equally useful in the washing of dogs, and for stables, &c. A small quantity of this disinfectant, mixed with a pail of water occasionally thrown into the dustbin will render it harmless, though the refuse should of course be removed at frequent intervals. The advantages of creosote as a preserver of wood is well known, and the carbolated creosote may be used with advantage as a disinfectant and

preserver, mixed with water and used as a paint for covering walls, woodwork, &c., before papering. Professor Attfield speaks of it in high terms; so also does Dr. Cameron, F.R.C.S.I., as a 'most powerful sanitary agent.' It has been extensively used during the recent hot weather for the deodorising of the London sewers, and Dr. Sedgwick Saunders, the Medical Officer of Health for the City of London, strongly recommends it.

A HANDY SULPHUR FUMIGATOR.

MR. T. SIMPSON, the Sanitary Inspector of Hillhead, Glasgow, has invented a new Sulphur Burner and Fumigator, a drawing of which is appended. Outside measurements, 8 inches in diameter and 5 inches deep. It consists



of two copper vessels, cylindrical in form, the one sits inside the other, leaving about an inch of space between the sides and three inches between the bottoms. The inner one can be removed at pleasure for the purpose of placing the sulphur in it, or for extracting the water which is placed in the outer one; to the top of the inner one is fixed the gas pipe, the coupling of which acts as a handle for lifting it in or out, and which fits into a notch in the outer shell. When in use, the outer one is filled with water as shown in drawing, and the sulphur in the inner one, the flame from the gas striking the sulphur and keeping it alive, at the same time heating the water and causing it to evaporate rendering the atmosphere of the room moist and thereby completing the disinfection, and the water, in said outer shell, preventing any danger of fire in the apartment. The cover is for placing on it when carrying it from place to place. The apparatus may be had from Messrs. Reid & Co., Plumbers and Sanitary Engineers, Byars Road, Hillhead, Glasgow. Mr. Simpson has had this apparatus in use for four years and finds it very satisfactory, and it was exhibited and highly commended at the meeting of the Sanitary Association of Scotland held at Perth on the 20th ult.

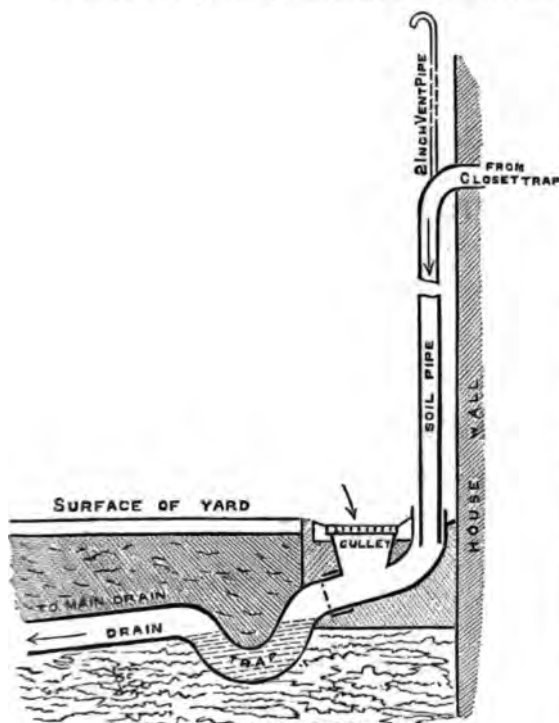
CAMPBELL & CO.'S SANITARY FLAKE CHARCOAL.

AMONGST the deodorisers and disinfectants now at command, the Flake Charcoal manufactured by Messrs. Campbell & Co., Cartvale Chemical Works, Paisley, deserves recognition. The value of charcoal as a deodoriser is a recognised fact, and if it could be produced in sufficient quantities and at a price that would enable local boards and other authorities to use it indiscriminately, it would be a very great boon. That consummation is at the present time impossible, but there are some districts more favoured than others, and the one around Messrs. Campbell's works is a case in point; where through the influence of Dr. Richmond, the Medical Officer of Health of Paisley, the flake charcoal is in indiscriminate use all over the district for dry closets, cesspools, middens, and decaying matter. Messrs. Campbell, who are extensive chemical manufacturers, produce this valuable disinfectant in large quantities from one of their residuums. It is made from birch wood chips and shavings free from bark, being the residue from the destructive distillation of these substances in the patent retorts used by the firm. The charcoal weighs only 10 lbs. to the cubic foot, and, though bulky, lies close. It is sold in bags containing about five bushels,

and delivered in Glasgow and surrounding neighbourhoods about the same distance at 2s. per bag, at which price it may reasonably be considered that it may be used without stint. It is to be presumed that as Messrs. Campbell can afford to sell it at such a low price they can produce it in large quantities. All that is required in using it is to cover entirely the matter to be deodorised, a depth of about two inches being preferable, when no fear need be felt in reference to the most putrid matter. For dry closets and middens, less than half this depth is sufficient. The writer has made an experiment with it on a dead rat rather far 'gone,' with the most satisfactory results. As chemical works abound in many districts, perhaps some other firms who use wood in the same manner as Messrs. Campbell will be induced to try the experiment, and so benefit their neighbourhoods, and utilise what may be assumed to be an almost useless residuum. The firm will deliver this charcoal F.O.R. London at the price quoted in 4-ton lots, bags included, about 40 to the ton.

A NEW 'CUT-OFF.'

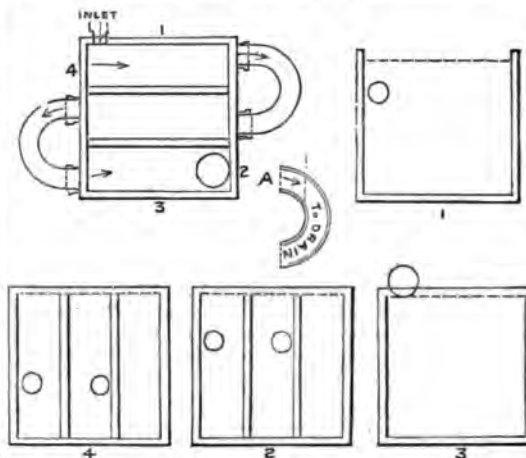
MR. WILLIAM GRAY, M.R.I.A., District Officer of Public Works, Belfast, exhibited at the meeting of the Medical Association in August what he terms a 'cut-off,' by means of which any residence or other premises can be effectively 'cut off' or disconnected from the town or main sewers, so as to prevent the return of sewer-gas. Several plans have been devised for this purpose, from which Mr. Gray's 'cut-off' differs only in being more simple in construction and effective in operation, while at the same time it renders



the house drainage accessible for examination at all times, so that the householder can see for himself that the drains are in proper order. The 'cut-off' is formed of terra-cotta, and consists of a dished open chamber or air space through which all the house sewage must pass, and from which it is conducted rapidly by a syphon trap into the town sewer. The foot of soil-pipe enters this chamber, and with the vent pipe at top promotes a constant current of fresh air through the soil-pipe, while the sewer-gas is completely excluded.

A NEW GREASE TRAP.

MR. S. COWAN, joiner to W. H. Maxwell, Esq., of Munches, Dalbeattie, N.B., sends us a sketch, as under, of a grease trap, for which he has taken provisional protection, and intends exhibiting at Dublin, on the Exhibition of the Sanitary Institute, to be held in October next. He formerly found a grease trap at Munches, which was placed about 60 feet from the scullery sink. The interior of this



trap formed a perfect cube of 2 feet each way, with a bend into it, the outlet being some 6 inches below the water. The wastes there ran through another trap of the same dimensions, with inlet and outlet from the surface of the water. The outfall drain from this last chamber was a 4-inch ordinary drain tile, and in three years the whole got completely stopped up with grease.

A few months ago he devised the above trap, which is built in brickwork, with bends at each end, by means of 4-inch fireclay material, and he fixed on the top a concrete frame with $\frac{3}{4}$ -inch iron lid, and placed outside of wall from scullery sink, and recommends a 3-inch air pipe from trap, where it can be carried out, to carry off steam, &c. His intention is to have them altogether made of fireclay. The main feature of this trap is the distance the water has to flow before leaving the trap, and by this plan the water gets thoroughly cooled and the grease floats to the surface.

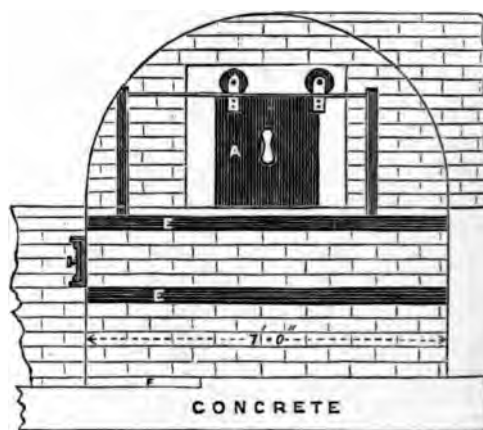
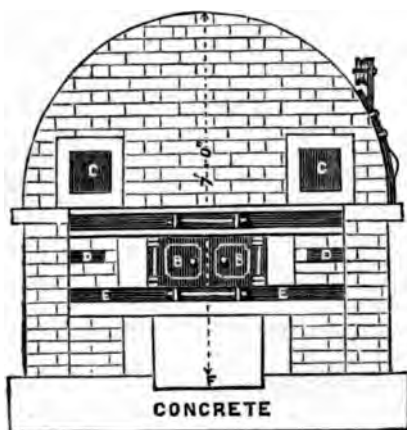
THE 'BEE-HIVE' REFUSE DESTROYER.

A NEW furnace for the destruction of town's refuse has recently been invented by J. E. Stafford, Esq., A.M.I.C.E., the Borough Engineer of Burnley, which promises to be extensively adopted. The scavenging in the town of Burnley during the past five years has cost on an average 1,500l. per annum. This cost will be considerably reduced in consequence of the erection of this Destructor, which will consume a large amount of the sweepings, &c., which previously had to be carted some considerable distance to several depôts in the town, and afterwards disposed of to farmers and others at an average price of 4d. per cartload. Great complaints were raised by the public, especially in summer, of the objectionable smells which arose from the matter deposited at these depôts, and no doubt the medical officer of health was perfectly justified in condemning these depôts as detrimental to the health of the public. The expense incurred in the labour required in stacking up, and keeping a check on the carts owned by persons who purchased this matter, also the cost of disinfecting the same, was not by a considerable sum balanced by the revenue derived from it, as during the last five years the average sum derived on this account was 50l. per annum, and the expenditure in men's wages alone was 54l. 12s. After the depôts had been condemned, the matter was disposed of by water-carriage, but this arrange-

ment obviated but slightly what had previously occurred, the boats having, of course, to stand at the canal bank until they were loaded, and giving, as before, great cause of complaint about the nuisance arising therefrom. The Destructor recently erected is working most successfully, and gives the greatest satisfaction to the public. All descriptions of the most objectionable matter produced by the town, such as offal from slaughter-houses and fishmongers' shops, garbage, ashpit contents, street sweepings, &c., are being effectually destroyed without smell or residue, and a considerable saving in the expense of carting the sweepings has been made in consequence of the convenient position in which the Destructor is placed. This the writer saw about a fortnight since, under the guidance of Mr. Stafford, the inventor, and Mr. Birtwistle, of Burnley, the maker, and was very much struck with the heterogeneous character of the matter that had to be dealt with. The rapidity with which the Destructor disposed of it was remarkable, and although inspected during the very hottest weather, not the slightest unpleasantness was apparent; in fact, the effective manner in which it accomplished its work left no doubt on his mind as to the value of the invention. Two illustrations of it are appended, fig. 1 being a front, and fig. 2 a side elevation, by which it will be observed that it is only 7 ft. high, and the same size in diameter. A is the feed hole for refuse, running to and fro on rollers, and nearly on the level of

thoroughly established, numerous inquiries have been made and deputations from other towns have visited Burnley to see its effects; it is stated that in every case the visit has resulted in an order being given for one or more. Amongst these deputations one from the Vestry of Richmond, Surrey, who had heard of the success of the Destructor, were induced of their own accord to pay a visit to Burnley, and the result was that the vestry decided to have two erected for ridding themselves of a nuisance that has become a matter of momentous import to all localities where large bodies of people reside.

It is certainly very creditable to the public spirit of this charming Thames-side town that it has been the first in the metropolitan district to adopt the Destructor, which was visited by the writer on September 2. There being no chimney-stack at Richmond, it became necessary to erect one, which has been built in the Corporation Yard near to New Richmond. Here a handsome stack has been built by Messrs. T. Birtwistle & Co., of Burnley, some ninety feet high; and the greater part of the bricks used in its construction have been sent by rail from Burnley, as the London-made bricks were utterly repudiated by Mr. Birtwistle and Mr. Lomas, the London agent. The Burnley bricks are of superior make, and specially suited for the purpose of building stacks. The chimney is built square at the base, and at opposite ends of the two parts of the square a Destructor is erected, a 'mid-



platform where the refuse is shot; B, feed hole for fuel; C, peep holes; D, air holes; E, wrought iron bands, carried round circumference; F, water hearth. It is made entirely of fire-clay bricks of the finest quality, and presuming that a chimney stack exists (as it did at Burnley) wherever the Destructor is erected the entire cost amounts to about 100*l*. The one in question is destroying on an average twenty-four loads per day of about 19 cwt. each, and the writer was assured that the entire cost (labour of all kinds included) does not exceed 10*d*. per load. The residuum, which is remarkably small, falls into a water tank underneath, where it is quickly cooled, and the steam evaporated from this water tends to keep the bars of the furnace cool. According to the kind of matter being burnt, so is the residuum, and the lighter kind is so fine that it can be utilised for mixing with mortar, while the heavier, which takes the form of clinkers, makes good material for the underlying or bedding for roads, and it is not improbable that, all things considered, the cost of scavenging in the town of Burnley will eventually be reduced to almost nil. Mr. Stafford's idea is that by erecting Destructors in different neighbourhoods, each locality will be enabled to get rid of its own productions. Cartage to a central spot will be dispensed with, and the inhabitants of different districts will not be annoyed by the smells arising from the garbage being transported through a long line of streets.

Since the success of the Beehive Destructor has been

'feather' in the chimney securing an independent fire for each; and arrangements have been made in building the stack for two more Destructors to be erected on the other sides of the square. The entire cost of the stack and two Destructors has been 450*l*., while the other two can be set up when required at an expense of about 100*l*. each. Although only just set to work, the employees at Richmond appear to understand the value of the Destructors, and are working with a will at them. A few weeks' experience will doubtless convince the inhabitants of the value of the step taken by their authorities. The remarks as to the class of matter being burnt at Burnley apply equally to Richmond, where the dustbins appear to be receptacles for everything that enters the house, animal, vegetable, and mineral, manufactured and unmanufactured.

The work done at Richmond by Messrs. Birtwistle is not a profitable undertaking, in consequence of the desire of the firm to make the work a pattern for the London district; their estimate was also based on the supposition that bricks could be purchased in the neighbourhood suitable for their undertaking; but, as events turned out, nearly all had to be sent from Burnley—to their loss, but to the gain of the Richmond authorities. Mr. Lomas (who has acted throughout as Messrs. Birtwistle's agent, and is a retired Burnley manufacturer) has taken up the matter as much from a desire to assist his townsmen as from any desire of gain, and he is to be complimented on the

which the whole affair has been carried out. Individuals or corporate bodies who feel interested in the matter of Refuse Destruction, will do well to address Mr. Twistle & Co., Burnley, who have carried out Mr. Twistle's ideas in a most satisfactory manner.

HYDRAULIC RAMS AT THE HEALTH EXHIBITION.

Attention has just been called by Messrs. Sharp & Horn Viaduct, to the powerful Hydraulic Rams (recently shown by them at this exhibition. Three hydraulic rams were fixed in the private portion of the exhibition during the last few weeks have undergone tests at the hands of the jurors (all experts in hydraulics), and as we are informed, to their entire satisfaction. Persons interested in water raising will do well to visit the rams at Messrs. Sharp & Co.'s stand, in the East Central Gallery. Further details of these appliances, with illustrative diagrams, will be published later on in the SANITARY RECORD.

CORRESPONDENCE.

Communications must bear the signature of the writer, not necessarily for publication.

LEGAL DEFINITION OF INFECTED CLOTHING.

I am allowed to say that I think you have done a valuable service in opening your columns to a discussion of this subject. It is a very unfortunate thing that there should be so much doubt as to the proper interpretation of the section of the Public Health Act which treats of the matter. But I have myself no such difficulty; the wording of the section appears to me clear and decisive—it provides that 'any person who . . . exposes without precaution any . . . clothing . . . or other article which has been exposed to infection . . . shall be liable to a penalty not exceeding five pounds.' There is no indication in your note that you think it necessary to be proved that the clothing has been 'infected'. I cannot see that the wording of the section requires this. I think it only requires to be proved that the clothing has been 'exposed' to infection without precaution. I have twice in the course of the last few months had proceedings instituted against persons who had offended against what I have explained as my interpretation of the section, and on each occasion successfully. The first case occurred in Jarrow. I received notice of a case of small-pox; on going to the house the patient was a child; the house was a small detached house—part of a tenemented dwelling, and the isolation of the case at home was impossible. I earnestly advised the mother to consent to the removal of the patient to hospital, but she declined. I then directed her to her possibilities of prosecution under the Act; she still declined. I then desired the sanitary inspector to take note of the clothing the mother had exposed, so far as practicable, to keep watch upon the case. He did so, and one day, while the scabs were on the child, he found the woman had gone out following her, found she had gone in the dress she had been nursing the child. I directed proceedings to be taken, and a conviction was obtained. In the second case, having information that there was 'a case' in a particular house in South Shields, I went there accompanied by the sanitary inspector. I found a man suffering from small-pox; after some time he agreed to go into hospital. I then told the sanitary inspector the nature of the disease, and he took immediate steps for the removal of the patient to hospital. Immediately after leaving the house I directed the sanitary inspector back for some purpose or another, and found that the woman had left the house im-

mediately we had left; he followed her, and found her in an adjoining house, washing a newly-born infant, in the same room with the parturient woman, and wearing the dress in which she had nursed the small-pox patient. I directed a prosecution to be raised against the woman, and again a conviction was obtained. In neither case did the town clerk, magistrates' clerks, or magistrates seem to have any difficulty as to the interpretation of the phrase. It may be urged that the medical man in attendance in such cases is liable to a prosecution under this section, and I consider that such is technically the case, though I cannot imagine any sanitary authority foolish enough to raise such a prosecution. The section might very well be altered to meet this difficulty.

I very much sympathise with my friend Mr. Harris in the difficulty in which he was placed by the ruling of the town clerk of Sunderland; as, with the reading of the 124th section, which I believe to be the only safe one upon which to act (that is, that the phrase 'without proper lodging or accommodation' merely requires proper accommodation for the welfare of the patient, and not for purposes of sufficient isolation), our power to deal with 'dangerous epidemic disorders' would indeed be limited, if the interpretation put upon the 126th section by the town clerk of Sunderland were generally accepted.

I venture to hope, considering the importance of the subject, that you will not regard this communication as an undue intrusion on your space.

A. CAMPBELL MUNRO, M.B., D.Sc.

Health Office, South Shields.

[On the contrary, discussions such as these are extremely valuable in bringing out the defects of the existing law, and in indicating the directions in which it needs to be strengthened. Probably, most people would be content with our correspondent's interpretation of Section 126, which seems, indeed, to be the sensible if not the most strictly legal view of the matter. But with the chance of this ruling being upset by a superior court, magistrates find themselves not infrequently obliged to give a narrower interpretation to Acts of Parliament than sanitary officials could desire.—ED.]

THE COMMUNICABILITY OF ENTERIC FEVER.

Sir,—Your correspondent 'X. Y. Z.' quotes Dr. Britton's opinion that in typhoid cases 'attendants on the sick rarely, if ever, take the disease from them.'

Against this opinion we have the following facts given by Dr. Collie in your July number, that at the under-mentioned hospitals—viz., Homerton, Hampstead, Deptford, Stockwell, Shadwell, St. Thomas's, London Fever and the Royal Free Hospital attendants on the sick have contracted this disease from them.

In the face of these proved facts the mere citation of book-lore becomes valueless and delusive, and I question if Dr. Collie will support the interpretation put on his article by 'X. Y. Z.,' especially in the closing paragraph of the latter's letter of July 22, wherein he states that 'Dr. Collie apparently agrees with him.'

It may be well for a moment to consider what this suggested agreement means. The contention of 'X. Y. Z.' and of 'Dilemma' has been that there is no necessity for removing typhoid patients from the homes of the poor to a fever hospital, that they may be safely treated in their cottages and nursed by their wives, mothers or sisters, as the case may be, without danger of the latter acquiring the disease.

We find from Dr. Collie's article that in eight London hospitals, well-ventilated, fully supplied with the best disinfectants, with nurses trained and skilful, knowing exactly what should be done to avoid infection, with plenty of air space for each patient, this disease does spread, and as regards the Royal Free and the London Fever Hospitals, no less than fifteen nurses have contracted this dangerous disease.

Yet 'X. Y. Z.' claims Dr. Collie as in agreement with him in contending that in the crowded and ill-ventilated dwellings of the poor, deficient in every way for the safe treatment of a communicable disease, with the sick and the healthy sleeping as they must do within a few inches of each other, typhoid patients can be safely treated without danger to the health of the remaining inmates, that in fact what cannot be done, as is proved, in the airy and spacious wards of well-appointed hospitals without grave danger, may be safely done in crowded cottages, with no skilled nursing, bad ventilation, and inadequate breathing space.

The whole tenor of Dr. Collie's article was opposed to such an assumption as this. I believe the doctrine held by 'Dilemma' that it may possibly be 'advisable' to remove typhoid patients to a fever hospital, but never 'necessary' to do so is fraught with danger to public health, and on that account I have protested and shall continue to protest against it.

As to the other matters referred to in your correspondent's letter they are purely personal and may well be passed over; but, at any rate, it will suffice for me to reaffirm my first statement of particulars.

August 23, 1884.

M. S. E.

CHEAP DINNERS FOR DESTITUTE BOARD SCHOOL CHILDREN.

The Committee of Representative Managers of London Board Schools have sent us a circular from the sub-committee appointed to consider the subject of cheap dinners for destitute scholars. It deals with a pressing and difficult question in a very practical way.

The circular states that in several of the Board Schools many children are unable to learn as much as they otherwise would from the fact that they are insufficiently fed. How to supply this want without pauperising the parents is a difficult problem, but from careful inquiry made by the sub-committee, they have ascertained that under certain conditions substantial and nutritious dinners can be provided at 1d. each to pay all expenses.

The following dinners have thus been supplied recently at certain Centres: Soup with bread and bread and jam; bacon sandwiches and bread and jam; jam roly-polly pudding; stewed meat; cold bacon and bread; hot bacon and beans; Irish stew; beef and macaroni; currant pudding; stewed meat and vegetables; rice with milk and treacle or sugar; bacon and hot potatoes; bread and cheese; bread and jam.

The conditions necessary to make such dinners self-supporting at 1d. each, are:—1. An average daily attendance of about 200 children, including those whose portions are purchased for home consumption. 2. Skillful organisation in buying and preparing the necessary food. 3. A suitable room, with one or two coppers available, in the neighbourhood of one or more Board Schools, which can be hired at a moderate rent. 4. A sum of about £10 for preliminary expenses.

As it is extremely desirable that efforts should be made in various localities to meet the need of under-fed scholars during the coming winter, the representative of each school or group of schools is earnestly requested by the Chairman of the Committee, R. J. Simpson, Esq., to bring the subject before his committee at the next meeting, and to be good enough to send replies to the following questions to H. Forbes Clarke, Esq., the hon. sec. of the sub-committee, as soon as possible. If only a few children in any school are in need of such help, the sub-committee will be glad to know, as a centre might be arranged for several schools in any given locality.

The questions to be replied to are:—1. Are there any schools in your group for which such provision is necessary? If so, please name them. 2. About how many children in each school would be likely to purchase penny dinners daily? 3. Is there any suitable room available in your district? 4. Are there any managers or other local persons who are willing to provide or to help in providing such dinners?

Further information can be obtained of the Hon. Sec. of Sub-Committee, H. Forbes Clarke, Esq., Camden House, Hungerford Road, Holloway, N.

HOUSING OF THE WORKING CLASSES.

*'How best to help the slender store,
How mend the dwellings of the poor?'*

THE ROYAL COMMISSION.—The Government appear to have repented them of their determination expressed in Parliament some months ago by Sir Charles Dilke, not to add to the Royal Commission on the Homes of the Poor any members to represent Scotland and Ireland; for it has lately been announced that Sir George Harrison, the present Lord Provost of Edinburgh, and Mr. Dwyer Gray, M.P., a former Lord Mayor of Dublin, have been

added to the Commission. The former has evidently determined to justify his appointment forthwith; for we read that in company with Lord Carrington, who has developed quite a taste for 'slumming,' he made the other day a minute inspection of some of the worst quarters of the city over which he presides. The 'closes' of Edinburgh are historical, and perhaps on that account may safely be set down as dirty. The enormously high houses that are so conspicuous a feature of the city architecture have their own special sanitary lessons to teach; and we may hope for some useful result from the 'copious notes' that Lord Carrington is reported to have taken during his inspection.

A DISGRACEFUL case of overcrowding has been brought before the borough magistrates of Folkestone, on an application by the Town Council for an order to compel the occupiers of the house to abate the nuisance. It appeared from the evidence of Dr. Bateman, the medical officer of health, and the inspector of nuisances, that a small four-roomed cottage, with scullery and box-room, had been tenanted by no less than four families, comprising nineteen persons, the ages varying from old age to infancy. In addition to this there was no water supply to the house. The defendants complained of the want of cheaper and better occupations for the poorer classes. The magistrates made the necessary order, remarking that, according to the cubic capacity, not more than six persons should occupy the house.

THE *City Press* states that it is proposed to erect a block of artisans' dwellings in Chatham Gardens, City Road, at a cost not to exceed £50,000. The property, which is known as Bleyton's Gift, is vested in trustees selected from the parishes of St. Giles, Cripplegate, and St. Luke's, Old Street. The Charity Commissioners have approved generally of the scheme, and the details only remain to be settled.

A GRATIFYING account of the working of the Labourers' (Ireland) Act, 1883, is given in the report of the Irish Local Government Board just issued. By the end of the present year the Board estimate that they will have made orders confirming schemes by the sanitary authorities to provide over 2,800 labourers' dwellings with land attached thereto. In addition to this, however, it is reported that the Act has been indirectly the means of drawing attention to the defective sanitary state of labourers' dwellings in many localities where improvements have since been voluntarily effected by the owners.

PARKS AND OPEN SPACES.

*The law condemns both man and woman
Who steals the goose from off the common;
But lets the greater felon loose,
Who steals the common from the goose.*

THE PECKHAM RYE COMMONS.—Since the Metropolitan Board of Works took possession of these commons in the early part of last year, a series of improvements have been effected. These improvements are now nearly completed, and from the deplorable condition in which the commons were two years ago, they have been transformed into the most pleasant open spaces in South London. At the entrance to the Rye is a large open space, which, from its proximity to the main road, has by constant traffic been entirely denuded of grass for years past. This spot has been enclosed and a shrubbery planted, and a portion of the lower end of the Rye has also been partially enclosed. All the grass has been re-sown, and to prevent inconvenience to the public a small portion only of the common has been enclosed at one time. East Dulwich Green has been levelled and enclosed, and Nunhead Green has also been partially enclosed.

IN America the importance of country holidays for poor

lren seems to be more widely recognised than in 1883 in this direction, in connection with a report published of the amount of last year was upwards of 3,000l., and for this year had the benefit of a fortnight's holiday in 1883, and 5,700 had a day trip. The Prince of Wales formally opened the Park at Newcastle-on-Tyne amidst much rejoicing. At the same time the Princess of Wales planted a tree as a memento of the occasion.

LAW REPORTS.

POLLUTING THE WATER SUPPLY.

LLIS appeared at the Police-court, Clerkenwell, on a summons issued at the instance of the New River Company, under the Waterworks Clauses Act of 1862, for polluting the water supply of the New River, by washing, throwing, or causing to enter the New River, a certain dog. Evidence was given to prove that the defendant's dog entered the river, and was one of the sources of the water supply of the New River. The defendant said he was surprised to be prosecuted for so trivial an affair. He was constantly sending their dogs into the river, and the dog was taken of it. Mr. Barstow said he did not consider the offence trivial. It was a very dirty trick, and the people were in the habit of doing it, he said. The New River Company would take it up. He was fined 40s., with 2s. cost.

TINNED TOMATOES.

for 50,000 dollars damages has been brought against Messrs. Thurber, Whyland, & Co., grocers, of New York City, by Miss Kolver, as compensation for injury done to her health through eating tomatoes from cans by that firm. In her bill of complaint Miss Kolver states that the tomatoes in question were labelled 'No. 1' quality, and that her father was thereby injured on March 5 last, to purchase a number of cans from a Brooklyn grocer. They were cooked and she ate them, and they proved poisonous, and she became so ill that for a time was despaired of and her health was injured, all of which entailed heavy doctors' bills, which, falling into the cans, poisoned their contents. The suit is based on an examination of the cans, made by Dr. Bartley, of the Health Department, who reported that the symptoms were those which could be caused by poisoning from muriate of soda as is used in soldering the cans. Eight similar cans were awaiting the result of Miss Kolver's action.

THE ABATEMENT OF NUISANCES.

of some importance to sanitary authorities was decided on Sept. 5 before the Melksham Petty Sessions, Messrs. Heathcote, and Stancomb being the sitting

Melksham Rural Sanitary Authority summoned the defendant for non-compliance with their order to abate serious sanitary defects in a cottage of which he was the owner. It appeared from the evidence that the defendant, the inspector of nuisances, and Dr. medical officer of health, that the water supply was contaminated with sewage which soaked from a large tank into the living-room of the cottage. These facts proved that a supply of water should be obtained from the Trowbridge Water Company, which passed the defendant the pool should be cleansed from all sewage and thereafter filled in; and that a proper drain should be constructed of glazed socketed pipes. The defendant refused to lay on a supply of water, and the authority had the work executed in terms of the Public Health Act, 1875. On being threatened

with a summons, defendant filled up the pool with gravel, but did not remove the sewage matter. He also made a drain, but used agricultural pipes in its construction. The sanitary authority did not consider this a satisfactory abatement of the nuisance, and directed their inspector to write to defendant stating that proceedings would be taken against him. For the defendant, Dr. Grose, of Melksham, sent a written statement, stating that he had inspected the premises, and considered their sanitary condition to be most satisfactory. The magistrates, after consultation, dismissed the case, on the grounds that the sanitary authority ought to have sent a second formal notice to defendant after resolving to take legal proceedings. The magistrates who tried the case are all *ex-officio* members of the prosecuting sanitary authority. It should be stated that a case of enteric fever broke out in the cottage complained of.

CREMATION NOTES.

THE crematory now building by the United States Cremation Society is in a forward state, and it is stated that several dead bodies are already in waiting for its completion in November. It is situated in East Williamsburg, New York, between two cemeteries. The structure is 74 feet long by 40 feet wide, and in design resembles a Greek temple, with façade and return walls ornamented with Corinthian columns. It is to be the latest improvement in crematories. One novelty will be dispatch. The body will be placed in a catafalque in the chapel, a curtain concealing it from view. During the services it will sink to the furnace without noise, and when the services are ended, an urn will be found in the catafalque containing the ashes. There will be no intimation that anything is going on but the services for the dead.

The body of an Indian gentleman has been cremated at Etretat. Baboo Sahed Chatjay, who had accompanied his son-in-law, Sampatras, the brother of the Maharajah Guicowar of Baroda, one of the chief princes of India, to Europe, died recently at Etretat of an abscess in the throat. Permission having been granted by the Mayor to cremate the body, at midnight wood was carted down to the beach, behind a jutting point in the cliff, hidden from the town, and there a pile of two or three feet in height was carefully built of logs crossed and recrossed, with the ends towards the north and south. The ceremony of sprinkling the sacred powder over the body and anointing it was very simple. An eye-witness, writing to *Galignani's Messenger*, describes the ceremony as follows: 'The fire was in a small earthen bowl, and was made of sandal-wood, which is difficult to obtain in Etretat. But in this case a carved box, a *souvenir* of India, was presented for the purpose to the mourners by an English lady, who happened to have it with her. The body was laid upon the pile, with the head towards the north, and then covered with more wood saturated with oil. It was now two o'clock, and the funeral pile was carefully built. The Prince Sampatras threw the burning incense in the bowl upon the north end of the pile, which instantly caught fire, and speedily the whole mass was wrapped in flames. In an hour they began to subside, and more wood was piled on. Gradually the morning dawned upon the ceremony. The wind had blown away most of the cinders, and among those remaining only a few pieces of bone, keeping their form, could be found, and those crumbled when they were touched. What human ashes could be distinguished were gathered up, a part being thrown into the sea, and the rest sealed up to be sent to India. By six o'clock every vestige of the cremation had disappeared. When the rumour reached the awakened inhabitants of Etretat, and brought them in crowds to the spot, they hardly believed what was told them, for they only saw a few blackened stones and a few loose shavings that had escaped from the burning.'

SANITARY JOTTINGS.

SANITARY.

THE operations of the Sanitas Company for the past half-year have resulted in a large increase of profit as compared with the corresponding period of last year; and the directors have, in consequence, declared an interim dividend for the half-year ended June 30 last at the rate of 10 per cent. per annum, payable now. The directors add that the business of the company is increasing satisfactorily.

It would seem that the evils arising from the undue consumption of alcoholic drinks attracted attention in this country some centuries since. Mr. Jennett Humphreys, of Cricklewood, sends the following lines, written in 1656, but which are equally applicable to the condition of affairs at the present day, to a daily contemporary.

'The Drunkard's Prospective, or Burning Glasse.
'Composed by Joseph Rigbie, Gentleman, Clerke of the Peace of the County Palatine of Lancaster.

'London: Printed for the Author, and are to be sold at the Brazen Serpent in St. Paul's Churchyard, 1656.'

'Drink beastes the heart and spoiles the brains,
Exiles all reason, all good graces staines,
Infatuates judgement, understanding blinds,
Perverts the wits, and doth corrupt the minds.
It doth surprize the thoughts, and it doth all
The powers and faculties of soule enthrall.

'Drunkards for nothing that is good are fit,
In all the world of earth, the baren'st bit.
Like to a dumb Jack in a virginall,
They have no voice in commonwealth at all.
They've no more use of them throughout the land
Than Jeroboam had of his withered hand.

'Health out o' th' body, wit out of the head,
Strength out o' th' joints, and every one to bed.
All moneys out a purse; drink out o' th' barrels,
Wife, children, out of doors, all into quarrels.

'To you churchwardens, constables, and others,
That love the Lord, the Church, the State, your brothers,
Your selves, your sons, the people of the land,
Put forth against this sin your helping hand.
Help, help the Lord, the lawes, some ground to win,
Against I say, against this mighty sinne.'

WATER SUPPLY.

WATER SUPPLY OF NEWMARKET.—New waterworks have just been inaugurated at Newmarket. The works consist of a well and pumping station at South Field, in the parish of Exning, and they are designed to be capable of supplying 100,000 gallons in twelve hours. The pumping-engine is of the horizontal condensing type, and the pumps are of three-throw description, one set drawing from the well and delivering into the softening tanks, the other drawing from the tanks and delivering into a reservoir situate on Warren Hill, at a height of about 200 feet above the main street of the town, with the capacity of holding about 250,000 gallons. The works are being adapted to allow of the use of Clark's softening process, which has the effect of reducing the hardness to about four degrees. The shaft of the well from which the water is drawn is 20 feet deep, having two bore holes of 18 inches each, and each 40 feet deep. The works are arranged to admit of duplication of the machinery should it become necessary, and at present the engine is capable of pumping 400 gallons per minute. The water pumped from the well is conducted into two large tanks in the rear of the pumping station, from which it is conducted to the reservoir at the other end of the town. Each tank is capable of containing 100,000 gallons, and adjoining these tanks is a smaller one, used for the preparation of lime water for mixing with the water newly

pumped from the well. The water newly pumped and for the purpose of softening it a flow of lime a proportion of one to ten is continued. Each tank is fitted with a suction float adopted for the with surface water only. The whole length of piping the company, including the mains, is estimated at nine miles. The well was sunk at South Field September 1883, and the works were commenced beginning of December. The estimated yield of is equal to twice the present requirements of the town. The total cost of the works—somewhat increased by the necessity of applying to Parliament on two occasions—has amounted to 14,000*l.* The works were designed by Messrs. Easton & Co., of 11 Delahay Street, Westminster. The machinery was erected by Messrs. S. S. Stott of Haslingden, near Manchester; and the building including the reservoir on Warren Hill, were carried out by a local firm, Messrs. Hook and Tetbut, of Messrs. J. Young & Co., of Hertford, laid the pipes which were supplied by Messrs. J. Oakes & Co. of Alfreton, Nottingham.

NOTICES OF MEETINGS.

VACCINATION OFFICERS' ASSOCIATION.

The next meeting of members of this association will be Saturday, September 20, at 2.30 P.M., at the Charing Cross Medical School, 6a Chandos Street, Strand, W.C.

AGENDA.—1. To read minutes of last meeting. 2. Correspondence. 3. The election of members and honorary members. 4. To receive the half-yearly returns of vaccination as sent to the Local Management Board on August 7. Members are requested to bring same. 5. To discuss the resolution carried by the St. James' Hospital on July 16, 1884, as to the advisability of transferring public vaccination from boards of guardians to vestries, and to move a resolution in favour of the same.
C. O. ELKERTON, Hon. Sec.
20 Clarendon Street, Piccadilly.

COMPETITIONS.

THE examination for certificates in Sanitary Science by the University of Cambridge will begin on Tuesday, October 7. The candidates, who must be on the *Medical Register* of the Kingdom, should be sent to Dr. Anningson, Cambridge, on or before September 28.

APPOINTMENTS UNDER THE PUBLIC HEALTH ACT.

MEDICAL OFFICERS OF HEALTH.

ADKINS, George, L.R.C.P.Lond., M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the P. St. Mary Rural Sanitary District, at £150 per annum.

BATES, Charles Pope, M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Ramsgate Sanitary District, at £25 for one year.

BROCKLEHURST, Thomas Howard, M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Urban Sanitary District, at £11 for the year ending 1885.

DANIEL, Woodruffe, M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Wareham Sanitary District, at £10 for one year.

DEAN, Francis, M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Northleach Rural Sanitary District, at £100 per annum (in addition to £25 per annum as Medical Officer to the Union Workhouse), *vice* resigned.

EVANS, William, L.R.C.P.Edin., M.R.C.S.Eng., has been appointed Medical Officer of Health for the Anglesey Sanitary District, at £125 for one year.

FENTON, Mark Anthony, M.D.Univ.Dub., L.R.C.S.Irel., has been appointed Medical Officer of Health for the Coventry Sanitary District, at £250 per annum.

FREER, John Henry, L.R.C.P.Lond., M.R.C.S.Eng., has been appointed Medical Officer of Health for the Kugele Sanitary District, at £10 per annum, for three years.

FUSSELL, Dr. Edward Francis, has been re-appointed Medical Officer of Health for the Newhaven Port Sanitary District, at £100 per annum, until March 25 next.

HAINES, Alfred Henry, M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Long Sutton Sanitary District, at the rate of £10 per annum until 1885 next.

HOPKINS, Henry, L.R.C.P.Edin., M.R.C.S.Eng., has been appointed Medical Officer of Health for the Southampton Port Sanitary District, at £100 per annum.

District, at the rate of 50 guineas per annum, until March 25 next, *vice* Bencraft, deceased.

JACK, Charles, M.D., C.M. Univ. Glasg., has been appointed Medical Officer of Health for the Horsforth Urban Sanitary District, Yorkshire, at £15 for one year, *vice* Libbey, resigned.

JEFFERY, Edward, M.D. Univ. King's Coll. Aberd., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Lowestoft Urban Sanitary District, at £90 for one year.

ONES, Richard, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Flint Urban Sanitary District, at £25 for one year.

YS, Francis Daniel, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Wareham and Purbeck Rural Sanitary District, at the rate of £100 per annum, till June 24, 1885.

ARTHRIDGE, Samuel, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Darlaston Urban Sanitary District, at £40 per annum.

MYTH, William John, M.D. Q. Univ. Irel., L.R.C.P. Edin., L.R.C.S. Edin., has been re-appointed Medical Officer of Health for the Baildon Urban Sanitary District, at £20 for one year.

YSON, Edmund John, L.R.C.P. Edin., L.R.C.S. Edin., has been re-appointed Medical Officer of Health for the Caxton and Arrington, the St. Neot's, and the Whittlesey Rural Sanitary Districts, and the St. Neot's Urban Sanitary District, at £277 for one year.

HOMERSON, Abram, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Grange Urban Sanitary District, Lancashire, at £15 per annum, *vice* Page, appointed an Inspector under the Local Government Board.

WALLIS, Frederick Michael, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the newly-formed Bexhill Urban Sanitary District, at £10 per annum.

SURVEYORS, CLERKS TO GUARDIANS, INSPECTORS OF NUISANCES, &C.

BILLINGHAM, Mr. Thomas, has been elected a Member of the Bromsgrove Local Board and Improvement Commissioners (the Urban Sanitary Authority), *vice* Hadley resigned.

BROADBENT, Mr. James, Branch manager of the Manchester and Liverpool District Bank, has been appointed Treasurer to the Corporation and Urban Sanitary Authority of Congleton, *vice* Krinks, resigned.

BUDDEN, Mr. Harry, has been re-appointed Surveyor and Inspector of Nuisances to the Corporation and Urban Sanitary Authority of Basingstoke, at £160, for one year.

CANTRELL, Mr. Thomas, has been appointed Accountant to the Corporation and Urban Sanitary Authority of Batley, at £200 per annum, *vice* Bidus deceased.

COLLAND, Mr. G. A., has been appointed Surveyor, Inspector of Nuisances, and Collector to the Loftus Local Board and Urban Sanitary Authority, Yorkshire, at £135 per annum, *vice* Stainton, appointed Surveyor and Inspector of Nuisances to the Eaton Local Board and Urban Sanitary Authority.

CRAWFORD, Mr. Charles Walter Payne, has been elected Chairman of the newly formed East Grinstead Local Board and Urban Sanitary Authority.

CROSS, Mr. John, Manager of the Poole Branch of the National Provincial Bank of England, Limited, has been appointed Treasurer to the Town Council and Urban Sanitary Authority of Poole, *vice* Hornsby, resigned.

DALLS, Mr. Robert, has been elected a Member of the Walsoken Local Board and Urban Sanitary Authority, *vice* Kerridge, resigned.

DAVIS, Mr. E. A., has been elected a Member of the Barking Town Local Board and Urban Sanitary Authority, *vice* Pitt, resigned.

DAVIS, Mr. Stephen Joshua, Manager of the Dartford Branch of the London and County Bank, has been appointed Treasurer to the Dartford Local Board and Urban Sanitary Authority, and to the Dartford Guardians and Rural Sanitary Authority, *vice* Smith, resigned.

DELA, Mr. J., late Surveyor to the Oldbury Local Board and Urban Sanitary Authority, has been appointed Consulting Surveyor, at £75 per annum.

DONSON, Mr. Richard, has been appointed Collector of Market Tolls to the Corporation and Urban Sanitary Authority of Ripon, at about £30 per annum, *vice* Marshall.

SARLAND, Mr. William, has been re-appointed Inspector of Nuisances for the Barnstaple Urban Sanitary District, Devon, at £80 per annum, from June 24.

MOGARD, Mr. Daniel, has been re-appointed Surveyor and Inspector of Nuisances to the Corporation and Urban Sanitary Authority of Kendal, at £140 per annum.

MOOWIN, Mr. W. M., bank manager, has been re-appointed Treasurer to the Bakewell Local Board and Urban Sanitary Authority, until March 25 next.

LAHMOND, Mr. John, has been appointed Inspector of Nuisances for the Rhyf Urban Sanitary District, at £70 per annum, *vice* Freeman, resigned.

RAD, Mr. George Serle, banker, has been appointed Treasurer to the newly formed East Grinstead Local Board and Urban Sanitary Authority.

BLAND, Mr. John, has been elected a Member of the Oldbury Local Board and Urban Sanitary Authority, *vice* Rae, resigned.

WERNES, Mr. W., has been re-appointed Inspector of Nuisances for the Bilton Urban Sanitary District, at £90 per annum.

WERNES, Mr. Joseph, has been elected a Member of the Withington Local Board and Urban Sanitary Authority, *vice* Whitworth, retired.

JONES, Mr. Oswald Flint, has been appointed Accountant to the Corporation and Urban Sanitary Authority of Eastbourne, at £200 per annum.

KASSELL, Mr. Edward, has been appointed Clerk, Surveyor, Inspector of Nuisances, and Collector to the Kirkby Lonsdale Local Board and Urban Sanitary Authority, at £70 per annum, *vice* Kemp, resigned.

KERRIDGE, Mr. James, has been appointed Surveyor to the Walsoken Local Board and Urban Sanitary Authority, at £20 per annum.

LANE, Col. Henry, has been elected Chairman of the newly formed Bexhill Local Board and Urban Sanitary Authority.

LANGHAM, Mr. Frederick A., solicitor, has been appointed Clerk to the newly formed Bexhill Local Board and Urban Sanitary Authority, at £25 per annum.

MOUNTAIN, Mr. Arthur H., has been appointed Surveyor to the Swinton and Pendlebury Local Board and Urban Sanitary Authority, at £140 per annum, *vice* Hooley, appointed to the Irwell Rural Sanitary Authority.

PENLINGTON, Mr. Robert Napier, has been elected a Member of the Dodworth Local Board and Urban Sanitary Authority, *vice* Senior, resigned.

RANGER, Mr. George, has been appointed Collector to the newly formed East Grinstead Local Board and Urban Sanitary Authority.

RAYMENT, Mr. William James, has been re-appointed Inspector of Nuisances for the Lowestoft Urban Sanitary District, at £60 for one year.

SMITH, Mr. Sydney, has been appointed Surveyor and Inspector of nuisances to the newly formed Bexhill Local Board and Urban Sanitary Authority, at £50 and £50 per annum.

SMITH, Mr. William, has been re-appointed Inspector of Nuisances for the Bakewell Urban Sanitary District for the year ending Sept. 20, 1885, upon the same terms as before.

SNOWDEN, Mr. David, has been appointed Collector to the Corporation and Urban Sanitary Authority of Louth, at fourpence in the pound Commission, until March 25 next, *vice* Brotherton, deceased.

SPRIGHT, Mr. William Watts, has been appointed Inspector of Nuisances for the Doncaster Rural Sanitary District, at £160 for one year, *vice* Wright, deceased.

STADMAN, Mr. Charles, has been appointed Inspector of Nuisances and School Attendance Officer for the Kidderminster Rural Sanitary District, at £100 per annum from year to year, *vice* Young, resigned.

STODDART, Mr. F. W., has been re-appointed Public Analyst for the City of New Sarum for one year.

TAYLOR, Mr. Henry, has been re-appointed Surveyor and Inspector of Nuisances to the Clevedon Local Board and Urban Sanitary Authority, at £90 per annum.

THOMSON, Mr. James R., manager of Parr's Bank, Chester, has been appointed Treasurer to the Hoole Local Board and Urban Sanitary Authority, *vice* Brown resigned.

WANKLYN, Mr. William Trevor, has been appointed Treasurer to the Corporation and Urban Sanitary Authority of Wigan, at £400 per annum, *vice* Holt.

WEDGE, Mr. Richard, has been re-appointed Inspector of Nuisances for the Cannock Rural Sanitary District, at £80 for one year.

WELLS, Mr. W. H., has been appointed Chief Inspector of Nuisances for the Kingston-upon-Hull Urban Sanitary District, at £150 per annum, *vice* Osborne.

WHEATLEY, Mr. Joseph, has been elected Chairman of the Mirfield Local Board and Urban Sanitary Authority, Yorkshire, *vice* Armitage, deceased.

WHEELWRIGHT, Mr. J. G., Banker, has been re-appointed Treasurer to the Ovenden Local Board and Urban Sanitary Authority, Yorkshire, at £20 per annum.

WILDING, Mr. Horace Joseph, has been appointed Accountant to the Corporation and Urban Sanitary Authority of Stoke-upon-Trent, at £100 per annum, *vice* Jones, appointed to Eastbourne.

WILKINSON, Mr. George, Solicitor, has been appointed Clerk to the Castle Ward Guardians, Rural Sanitary Authority, Assessment Committee, and School Attendance Committee, at salaries amounting in the aggregate to about £140 per annum, and fees as Superintendent Registrar of Births, &c., *vice* Arkle, resigned.

WITTS, Mr. John W., has been appointed Surveyor of Buildings and Inspector of Nuisances for the Wavertree Urban Sanitary District, at £120 per annum.

YEVIN, Mr. John, has been elected a Member of the Mirfield Local Board and Urban Sanitary Authority.

VACANCIES.

MEDICAL OFFICER OF HEALTH for the Nottingham Urban Sanitary District: £650 per annum.

MEDICAL OFFICER OF HEALTH for the Stafford Urban Sanitary District.

MEDICAL OFFICER OF HEALTH for the Wednesbury Urban Sanitary District: £80 per annum.

MEDICAL OFFICER OF HEALTH for the Bridgnorth Urban Sanitary District.

MEDICAL OFFICER OF HEALTH for the East Grinstead Urban Sanitary District.

CLERK and COLLECTOR to the Hinckley Local Board and Urban Sanitary Authority.

CLERK to the Twickenham Local Board and Urban Sanitary Authority.

CLERK to the Brentford Guardians and Rural Sanitary Authority.

SURVEYOR to the Oldbury Local Board and Urban Sanitary Authority: £100 per annum. Application 25th instant, to William Shakespeare, Clerk.

SURVEYOR to the Kenilworth Local Board and Urban Sanitary Authority.
 SURVEYOR to the Corporation and Urban Sanitary Authority of Northampton; £200 per annum. Application, 22nd instant, to William Shoosmith, Town Clerk.
 SURVEYOR, INSPECTOR OF NUISANCES, and COLLECTOR to the Consett Local Board and Urban Sanitary Authority.
 SURVEYOR and INSPECTOR OF NUISANCES to the East Grinstead Local Board and Urban Sanitary Authority; £200 per annum.
 SURVEYOR and INSPECTOR OF NUISANCES to the Lillington Local Board and Urban Sanitary Authority.
 SURVEYOR, INSPECTOR OF NUISANCES, and COLLECTOR, to the Wigton Local Board and Urban Sanitary Authority.
 INSPECTOR OF NUISANCES and SURVEYOR to the Market Harborough Rural Sanitary Authority; £110 and £20 per annum, from year to year. Application, 18th instant, to C. Burgoine, Clerk to the Authority.
 INSPECTOR OF NUISANCES for the Wells (Somerset) Rural Sanitary Authority; £40 per annum.
 INSPECTOR OF NUISANCES for the Nottingham Urban Sanitary District.
 COLLECTOR to the Melton Mowbray Local Board and Urban Sanitary Authority.
 COLLECTOR to the Sidmouth Local Board and Urban Sanitary Authority.

LOCAL INTELLIGENCE.

EAST GRINSTEAD LOCAL BOARD AND URBAN SANITARY AUTHORITY.—The first election of members has resulted in the return of Messrs. Edward Smeed by 502 votes, Henry Padwick 484, Charles Taylor 452, John Southey 439, John Tooth, 388, C. W. P. Crawford 382, William Vicesimus Stenning 363, George Bailie 354, Charles Absalom 330, Charles Henry Gattye 304, James Charlwood 302, and Abraham Foster 270. There were thirty-four nominations for the twelve seats.

LOWESTOFT IMPROVEMENT COMMISSIONERS AND URBAN SANITARY AUTHORITY.—At the annual election on September 4 the following (all retiring commissioners by rotation) were re-elected—viz.: For the East Ward—William Henchman Clubbe, Alfred Wilkinson, Robert B. Capps. For the West Ward—Adam Adams, William Mobbs, John Simpson Cragg. For the South Ward—John Louth Clemence, Alfred Lawrence, Edward Kerrison Harvey.

BILSTON IMPROVEMENT COMMISSIONERS AND URBAN SANITARY AUTHORITY.—At the annual election on September 4 the following were elected for the ensuing three years—viz.: Messrs. *George Onions, with 526 votes; James Bird, 518; Thomas Jeavons, 493; *Thomas Price, 412.—(*Retiring commissioners re-elected.)

RUNCORN IMPROVEMENT COMMISSIONERS AND URBAN SANITARY AUTHORITY.—At the annual election on the 4th instant the following were elected Members of the Board for the ensuing three years—viz.:—Messrs. F. A. Lake, 919 votes; W. Whittaker, 812; S. Taylor, 866; W. Fisher, 844; W. Handley, 842.

The Holywell Rural Sanitary Authority recently appointed Mr. A. Caradoc Williams Inspector of Nuisances, but the Local Government Board declined to confirm the appointment, stating that Mr. Williams, being a minor, could not, they were advised, hold it.

BEXHILL, Sussex, has been constituted a Local Government District, with a Board of nine members—viz.: Messrs. Arthur Sawyer Brook, Joseph Brown, Henry Lane, Samuel Ockenden (junior), Jesse Oliver, Samuel Scrivens, W. J. Smith, Thomas O. Thwaites, John Weston.

Chesham has at length been constituted a Local Government District, with a Board of nine members. The nominations are to be made by the 18th instant, and the voting papers to be issued on October 3, and collected on the 9th. Mr. Daniel Clare has been appointed the summoning officer.

The Town Council and Urban Sanitary Authority of Wells, Somersetshire, have increased the salary of Mr. Charles Brown, the Surveyor, from £50 to £70 per annum.

The Paignton Local Board and Urban Sanitary Authority have increased the salary of Mr. John Paine Stone, the Medical Officer of Health, from £20 to £25 per annum.

The Barnstaple Town Council and Urban Sanitary Authority have increased the salary of the Inspector of Nuisances from £26 to £80 per annum.

The Parish of Menai Bridge or Llandysilio has been constituted a Local Government District with a Board of nine Members, and Mr. H. Bulkeley Pryce has been appointed Returning Officer.

The Tunbridge Wells Local Board and Urban Sanitary Authority have, upon the recommendation of a Committee, increased the salary of Dr. William Stamford, the Medical Officer of Health, from £105 to £150 per annum.

The Staines Local Board and Urban Sanitary Authority have increased the salary of Mr. J. G. Gubbins, the collector, to £50 per annum.

The Chertsey Rural Sanitary Authority have, with the sanction of the Local Government Board, increased the salary of the Inspector of Nuisances from £180 to £200 per annum.

The Mansfield Improvement Commissioners and Urban Sanitary Authority have, upon the recommendation of the Sanitary Committee, increased the salary of Mr. Edward Clayton, the Inspector of Nuisances, from £60 to £80 per annum.

The Flint Town Council and Urban Sanitary Authority have increased the salary of Mr. Hugh Owen, the Surveyor, to £50 per annum.

The Nottingham Urban Sanitary Authority are not, at present, taking any step to appoint a successor to Dr. Seaton as Medical Officer of Health. Although he has been appointed to St. Luke,

Chelsea, he will continue to perform the duties of the former office for some time.

The Castleford Local Board and Urban Sanitary Authority have increased the salary of Mr. Ebenezer W. Kemp, the Medical Officer of Health, from £20 to £30 per annum.

The Maldon Rural Sanitary Authority have voted £50 to Mr. Alfred B. Brady, their Surveyor, for extra services in connection with the sewerage works.

At a meeting of the Sanitary Committee of the Town Council and Urban Sanitary Authority of Stamford on the 15th ult., three letters from the Local Government Board were read, relating to the appointment of a Medical Officer of Health, and the proposed reduction of salary from £30 to £20 per annum. The last letter stated that 'looking to the circumstances of the district and to the important nature of the duties devolving upon Medical Officers of Health, it appears to them that the salary hitherto assigned does not afford more than an adequate remuneration for the efficient discharge of those duties.' After a long discussion, the following resolution was passed unanimously:—'That in the opinion of this Committee a salary of £20 a year is an adequate remuneration for the efficient discharge of the ordinary duties devolving upon the Medical Officer of Health for the borough, and that the Town Clerk inform the Local Government Board of this resolution.'

The long contention between the Stafford Rural Sanitary Authority and the Local Government Board upon the proposed reduction by the former of the salary of the Medical Officer of Health from £75 to £50 per annum, came on again at the meeting on the 16th ult., when a letter from the Local Government Board was received and read, stating that 'the period for which the Medical Officer of Health was appointed, expired on March 25, and that it was obligatory on the Rural Sanitary Authority to appoint such an officer. The Board, therefore, trusted that the Authority would, without delay, give the whole subject their careful consideration, and submit a satisfactory proposal for the future discharge of the duties of the office.' The matter was then deferred to the next meeting on the 30th ult., when after considerable discussion, it was decided, as a compromise, to re-appoint Dr. Reid at £60 for the present year. As Mr. Dansey, the Inspector, promised to use his influence with the Board above to agree to it, they will doubtless do so, and thus end a very disagreeable business.

The Exmouth Local Board and Urban Sanitary Authority, have, upon the recommendation of the Finance Committee, increased the salary of Mr. Arthur Kempe, the medical officer of health, from £20 to £40 per annum.

Margam, near Neath, has been constituted a Local Government district, with a Board of nine members, viz., Messrs. Christopher Rice Mansel Talbot, M.P., Arthur Pendarves Vivian, M.P., William Savours Powell, Benjamin Daniel, David Roderick David, Edward Davies, Thomas David, Thomas Gray, and Edward Jones.

STOURBRIDGE IMPROVEMENT COMMISSIONERS AND URBAN SANITARY AUTHORITY.—At the annual election on the 4th instant, the following were elected commissioners for the ensuing three years, viz., Messrs. Henry James, with 205 votes, J. D. Penney, 197, and C. H. Collis, 191.

NOTES AND QUERIES.

Having for some time back been in the receipt of Queries appertaining strictly to sanitary work, and which it would be easy to answer, without having to refer our correspondent to competent professional advisers, we have opened a column in which to register such Queries and Replies thereto as can fairly be expected from us; and our subscribers and readers are invited to make such use of this column as will tend to benefit themselves and the community. Both Queries and Replies will, however, be subjected, if unnecessarily long, to a strict curtailment.

129. SEIZURE OF UNSOUND FOOD.

Can a person be convicted under Section 116 of the Public Health Act, 1875, for selling an article of food therein specified, either in a public market or elsewhere, the article being unfit for the food of man, or must the article first be seized on the spot by an officer authorised? A case here stands thus. A person purchases some fish in a public market which are found to be unfit for food, they are taken to a medical officer of health, and he certifies before a Justice of the peace that they are unwholesome and unfit for food of man, and they are ordered by the justice to be destroyed. Can the seller be proceeded against?

SANITAS.
 [To expose for sale, or to have possession of with intent to sell, things unfit for food is a nuisance at common law (Shillito v. Thompson, 1 Q.B.D. 28; A 5 L.J.M.C. 18). But in the case as above stated, Sections 116 and 117 of the Public Health Act would not apply. The wording of Section 116 evidently requires that the medical officer of health or inspector of nuisances shall inspect and examine any suspected article of food at the place of sale, for the section speaks of such articles, 'exposed for sale, or deposited in any place for the purpose of sale or of preparation for sale.' If, in the officer's judgment, the suspected article of food is diseased or unsound or unwholesome, 'or unfit for the food of man,' he may seize and carry away the same himself or by an assistant, in order to obtain a justice's order for its being destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man. The answer to the question asked must therefore be that the seller cannot be fined under Section 117, and it seems even doubtful how far the justice was within his legal powers in directing the destruction of the fish in question.—E.D.]

ORIGINAL PAPERS.

INAUGURAL ADDRESS.*

READ TO THE SANITARY INSTITUTE
OF GREAT BRITAIN.

BY SIR ROBERT RAWLINSON, C.B.,

PRESIDENT OF THE CONGRESS.

In the year 1879 the Corporation of Dublin has taken hand and has carried out various sanitary measures in the regulation of room-tenements, scavenging, improved abattoirs, and in labourers' dwellings. The purification of the River Liffey is, however, a work which remains unaccomplished. Sanitary science is as old as time—that is, we find references to laws and means for preserving health in the oldest books, as in the third book of Moses, Leviticus, reasons for some of the ceremonial regulations even now be easily understood, such as the use of unclean meats and isolation of contagious diseases—leprosy for instance. Leprosy in man, in garments, in sites, and in houses; the means for the purification, by burning, of tainted garments, and the pulling down and burning of the materials of leprosy houses may, with good reason, be adopted by Christian communities in all times. There are at this day what may be called leprous sites, produced through ages of contamination by human excreta, upon which dwell leprous-tainted houses, and in which dwell tainted inhabitants, having about their persons rags as clothing. That something akin to leprosy exists in sites and in houses may be seen from the fact that in our great towns, certainly, hospital surgeons recognise types of disease, and these the most malignant and deadly, arising from special streets, and even from houses; and when, to accomplish certain sanitary measures, these houses, streets, and inhabitants are removed, that type of disease ceases. A terrible condition, under which causes of both infectious and contagious, undoubtedly have not been fully recognised, so as to be met against and prevented. We shall, I trust, find nothing practical from some of our members, but the necessity there is for a readier and fuller recognition of the outbreak of certain diseases which have a tendency to spread with great rapidity when they are introduced.

On the other hand, one of the greatest works to be accomplished by sanitarians will be to stem the tide of sanitary ignorance now working so much mischief, and causing incalculable human misery, by increasing in any useful degree lessening the fearful sting.

It is not necessarily the duty of sanitarians to teach the doctrine that dirt and disease are in all cases cause and effect, neither is it their duty to teach that they are not. Dirt is to be removed or destroyed; disease is, as much as possible, to be prevented and so far as human agency extends men should strive for a sound mind in a sound body.

Do not suppose that, however much sanitary measures may aid in the promotion of comfort and reduction of disease, it will ever carry it to the verge even of full prevention, as there

are cosmical causes which are, and ever will be, beyond human control. Excesses of heat, excesses of draught, and excesses of cold have destroyed vegetable, animal, and human life over vast areas of the earth's surface almost to extinction, and there is nothing more certain than that cosmical changes in the seasons similar to those which have occurred in the past will be repeated in the future. We know nothing of the origin of life. We move at the bottom of an atmospheric ocean over which we have no absolute control; the composition of which, in bulk, we cannot alter. We find health under certain conditions; malarial disease and death under others, and how little can we effect these elements one way or the other? Let us note what are the elements we have to consider. The sun furnishes heat to evaporate the ocean water, and out of these elements proceed our meteorological changes. The vapour, invisible at first, forms into cloud, which again condenses into the form of snow, hail, dew, and rain, precipitating these over ocean and land. Clouds aggregate and brew up tornadoes and tempests, to settle down into the gentle and refreshing shower and breeze. All the pure water in springs, streams, rivers, and lakes, has been cloud-conveyed from the salt ocean to the sources and sites where we find it.

Modern sanitary science may dictate, as simple remedial measures for cities, main sewerage and house draining, with improved water-supply. But will such costly works, when executed and left alone, prevent cholera? We fear the reply must be, 'Certainly not; they are its foundation: but without other costly works of street-forming, paving, channelling, and persistent continuous good scavenging, most of the expenditure may have been wasted, as disease will continue to haunt defective and overcrowded room-tenements and unventilated houses. In some large seaport towns the poor live below the ground water-level; but in cities like Glasgow, Edinburgh, and Dublin the poor live in attics and tenement-houses, so that sewerage, draining, and scavenging is of little avail unless something further is done in the way of excreta removal, water-supply, and cleansing. In Dublin there are main sewers and drains, with a full supply of water, for the better classes; but, at the time of my inquiry (1879), for the poor who lived in room-tenements, there was no useful drainage, and practically no useful supply of water. There was no privy accommodation for the occupant of a room in a Dublin tenement. There was no water but at an external stand-pipe, situate at a distance, and involving labour to fetch and carry. A medical officer, when asked how the sick poor managed in the long nights of winter, replied, 'They use any utensil handy;' and when further asked as to their supply of water in the day-time, the reply was, 'a use of the same vessel for the water.' But Dublin is not by any means exceptional, as the town houses, room-tenements, and country cottages all over Great Britain, as also over every portion of the world which is inhabited, are dens filthy and swarming with vermin, because overcrowded, uncleansed, and under-ventilated. Of a truth, this question of house accommodation for the poor is the question of questions both for philanthropists and for statesmen, as here are the breeding dens of the roughs of all countries, nations, and tongues; in the single rooms are the seed-beds of disease and revolutions.

The saying that 'cleanliness is next to godliness'

* Inaugural Address delivered at Dublin on Sept. 30, 1884.

must not be taken as an axiom which cannot be disputed. That cleanliness has not been, and is not now, in many countries, considered necessary to godliness, religious ceremonials, both heathen and Christian, amply prove. Nations professing Christianity do not to this day practise cleanliness as ordained by Moses, and explained in Leviticus. But the Levitical laws—which inculcate cleanliness—indicate the existence of filth and filthy habits amongst the populations for whom they were devised. The Jews, as a nation, were not road-makers or bath-builders, as were the Greeks and Romans in their day of governing power; neither have we in Great Britain public baths which can rank with those which existed in Imperial Rome, though recently baths in private houses have become common, and public baths and washhouses have been and are being established by our principal municipal authorities.

It is now some thirty years since I first prepared a set of suggestions for the instruction of sanitary engineers, which have been accepted and applied in Great Britain and on the Continent, in British colonies, in British India, and throughout North America. As I have recently revised these suggestions, I propose to refer to them in this address, to give it practical value.

Houses should stand on a dry subsoil, and in all cases, for the cottage as for the palace, the area within the walls should be covered by a layer of concrete. Sites for houses should not be dug into the side of a hill, unless the subsoil is drained and the main walls are effectively isolated from the high ground behind. All house-walls should, at the foundation, or immediately above it, have a damp-proof course to prevent rottenness, which leads to the Levitically described leprosy. Sewers and drains should not be formed within the basements of houses. To every room in a house there should be means for fresh air ventilation. To every room to be occupied, day or night, there should be means for external daylight. Refuse should not be stored near any dwelling-house until it becomes putrid, but should be removed at short intervals.

There should be unceasing day by day scavenging. Villages, where the cottages are apart, cannot with advantage be sewered as houses in towns are; but they may be surface-drained, and have earth latrines, to be cleansed each week by a paid scavenger. The payment of one or more shillings per week to a selected resident labourer in proportion to the number of cottages.

A clean water-supply is necessary for country cottages. Springs of water may, in some cases, be brought from a distance cheaply by pipes to the centre of the village. The economy of such process may be thus illustrated: A gallon of water weighs 10 lbs. Five gallons of water weigh 50 lbs., and 365 times 50 lbs. for one year, and fifty cottages in a village, would require this weight, with the weight of the can or bucket added, to be carried from any spring. The total weight would be about 900 tons. This water, if piped, will flow to any convenient point and save to the villagers so much labour. This is a question for the consideration of Boards of Guardians and landlords. I have recently seen in North Wales, on the estate of H. D. Pochin, Esq., J.P., isolated farmhouses fully supplied with water brought half a mile by a pipe half-inch in diameter.

A water-supply to a town should be general. The source should be pure. The water should be filtered

and stored in covered reservoirs. The supply should not fall below fifteen gallons per head of the population; it should be at high pressure and service. Hand-carried supplies should not be used. There should be full and ready access to water for fire service.

It is practicable to take a supply of water to every yard, every house, and every room, and to supervise and manage these services to reduce waste and bring about economy. This, however, can only be done by unceasing supervision.

One difficulty to be contended with is the thoughtless improvidence of the poor, and instances of their mischievous disposition towards honesty, as pipes of lead may be stolen. Lead iron tubes may, however, be used for house drains as they are both cheaper and stronger than the metal, having no value, will not rust, and water under pressure, if mischievously used with in any tenement, will be so disagreeable to those who wilfully liberate it will soon close, or, if damaged, cry out for repairs, and again readily bring upon themselves the same and trouble. There are many towns in which where each cottage has an independent supply of pure water at their own taps, constantly in rent-charge of one shilling each quarter.

Where water is brought in there should be means and sinks to remove the waste-water. The pipes should not in any instance enter a sewer direct, but deliver over a small gulch connected with a drain. New houses in towns are recommended to adopt this method, and houses in London do adopt it. Town sewage-utilization, and river and stream purification are complicated questions in which there have been many mistakes, and out of which has arisen litigation.

The true purpose of town-sewering should be to remove all waste-water as generated; to dry subsoil, and so to dispose of sewage so as to cause no nuisance. Town-sewering is a science now in the course of maturing. I have already several volumes published on the subject in England, in America, and on the Continent.

Main-sewering, as now inculcated and practised, only dates from about the year 1845.

About 1852 I drew up fresh rules for main-sewering and house-draining, recommending that the rate should be proportioned to the special work which would be required to accomplish.

Natural watercourses were not, as in the City of London, to be formed into conduits. Surface-water was to be as practicable discharged by the ordinary water at and over the surface. Neither sewers nor drains were to be laid within the basements of houses. House-drains were to range from four to six inches in diameter, and were in all cases to be of ware-pipes or of cast-iron. The main-sewer was to be laid in right lines and have true inclinations; at changes of line or gradient manholes were to be formed having side-lampholes on the largest class of sewers, but movable on the small sewer manholes; these arrangements were to facilitate inspection and cleansing by Sewers and drains to be fully ventilated.

Any town sewered and drained on these principles is for all time under the inspection of the sanitary authority. The sewers being true in line can, from manhole, be seen through. At the surface,

of sewer can be sighted from manhole to lamphole, so that the surveyor knows exactly where to sink to find a side-connection. In the modern sewers side-connections are to form part of the first construction, so that house-drains may join without any charge of any sort for making such junction.

Under the old system of sewers no line was kept, but the trenches were opened out in short lengths, and the sewers were constructed irregularly, both in line and gradient. Side-connections were not formed, neither are they formed now on some of the metropolitan parish sewers, which are not under the general law, but the sewer is broken into, and the builder pays a fine for making the junction which ought to have been ready for use as part of the original construction. One effect has been that hundreds of large West End houses in London have never had the sewer opened to make the house-connection; so that the result has been house basement flooding, typhoid fever, and premature death.

Sewer and drain flushing with water is necessary to preserve these conduits clean. The automatic flushing tank is, therefore, an absolute necessity to the cleansing of drains and sewers. These flushing tanks—the invention of Mr. Rogers Field, C.E., one of the leading members of this Association—have become an absolute necessity. They accumulate any water turned into them up to the capacity of the tank, which may be from 50 to 500, or even 5,000, gallons, when, without further intervention, the entire volume of water is liberated at a regulated speed to flush the sewers or drains connected. The tank after each discharge fills again, and repeats the flushing operation at regulated intervals. Service boxes (small tanks), for flushing water-closets and urinals, are constructed on similar principles.

Sanitary science has been, and is yet, progressive. It is being studied by engineers both in Europe and in North America. In design and execution there are improvements, and, in some instances, the opposite. The complications connected with town sewerage are, however, so many and so various that definite rules to fit all places cannot be formulated. The problem cannot always be in the form of a rule-of-three sum; that is, rainfall, area, and main sewer capacity.

A sanitary engineer should, of course, be a meteorologist and a geologist; but then, why not also a botanist, as sewage develops strange growths. The engineer will study meteorology to learn the laws of the seasons, times, and volume of rain falling, not, however, to learn how large the sewers must be to remove the greatest volume of water falling in the least time, but how this water has passed away heretofore from the surface to be sewered, and with what effects.

Engineers, having much practice, will deal with each area specially, and construct their works so as best and most cheaply to accomplish the desired purposes—namely, to receive and remove wastewater and human excreta to some outlet or outlets, where they may be made harmless. Some engineers have thought that the heaviest known rainfall of a district must be provided for, hence calculations have been made as to capacities of sewers to remove some exceptionally heavy volume of rain within the hour; but if this rule were worked to, main sewers in our climate—for such populations as Birmingham—would have to be as large as railway tunnels. And for cities in India, such as Calcutta, Bombay, or Madras, main sewers of the dimensions of railway

tunnels would not serve, because rain occasionally falls at a rate of one inch per hour for many hours in continuance. The rule may appear absurd to those who have not studied the subject—namely, the heavier the rainfall, the less the capacity of the main sewers should be, as, during the period that such heavy rains continue, the entire surface is swamped—sewers, drains, and streets being alike under water.

In countries subject to these heavy falls of rain, there may be long intervals of excessive heat and dry weather, when at such times large sewers could only have a small volume of highly-concentrated sewage flowing through and evaporating rapidly, leaving sewage-sludge to putrefy and give off deadly gases. Sewers and drains in tropical climates must therefore be confined, in cross-sectional dimensions, to moderate volumes not exceeding some 150 gallons per head of the population. House-drains in no case need exceed 4 inches in diameter; and for establishments containing 1,000 persons, a drain of 9 inches in diameter will be sufficient.

In England, some towns having populations up to 10,000 have outlet-sewers from 15 inches to 18 inches in diameter, and these sewers have, in some instances, been working during the last thirty years, and have neither choked nor burst. Surface-water is not admitted. For valley-lines down which in former times flowed surface-water—small brook courses—the sewers must be of capacity to carry off floodwaters, there must also be overflows to the river, or there must be pumping-power to lift and discharge such storm-water above flood-level. But in these cases these surface-water channels ought not to have received sewage. This should have been removed by intercepting-drains.

This is a most important law which ought never to be disregarded—namely, do not inclose natural watercourses for main-sewering purposes, because the volume of surface-water flowing down a small brook will be dry, or nearly dry, for long periods; whilst in storms it may be an angry rushing torrent, so that during all dry periods, sewage if turned in would stagnate, evaporate, and leave all the slimy deposit to corrupt and become dangerous. That which is true for a tropical climate is in a lesser degree true under any other climate.

About the beginning of this century, when water-closets began to be used in better class houses in London, large coarsely-made brick drains ramified the basements of houses, and were connected with the flat-bottomed sewers. Sewage—that is, wastewater and excreta—was turned into the sewers, and, becoming putrid, foul gases were generated, which, pervading the houses, produced fevers to so serious an extent that house-drain connection with sewers direct was forbidden by Act of Parliament. Then came in the crowning evil, the cesspool. Houses having water-closets were ordered to sever the connection with the sewers, and cesspools were formed in yards and gardens, and beneath basements, to receive the contents of the water-closets; and to this day large foul brick drains and cesspools exist beneath large old houses in the metropolis and at mansions of noblemen and gentlemen throughout the country. How many premature deaths have been the result it is not possible to enumerate. This malarrangement was headed by Windsor Castle, where previous to 1849 there were within the basement fifty-one cesspools full and overflowing. At Gwydyr House—the first Board of Health in 1848—nine

cesspools were found within the basement, all full and overflowing. At Bowood, the country seat of Lord Lansdowne, the entire basement was ramified with sewers, along which men could walk upright, all of them containing sewage deposit. This was the condition of the seat of Earl Grey at Hawick; then there were leaking brick sewers and drains at Spencer House, St. James's, London; at Marlborough House; the house of the Marquis of Bristol, St. James's Square, and at Claremont. These palaces and houses have, however, been thoroughly and effectively drained, and are now in good condition. The great colleges at Oxford were in a similar foul condition, but Christ Church, Balliol, All Souls, Jesus, and Wadham have been fully drained at a cost of about 5,000*l.*; and some 800 of the lodging-houses have been improved, cesspools and foul drains removed, new water-closets and new drains put in, impure wells and pumps done away with, and water supplied from the public works at a cost of some 15,000*l.* The population of Oxford is about 40,000, and the rateable value some 200,000*l.* The city has been sewered and drained, and pumping engines, with a sewage farm, established at a cost of not less than 200,000*l.*, so that Oxford has expended within a few years on sanitary works not less than 273,000*l.* But Cambridge remains, with all its colleges, an undrained, river-polluted cesspool city. Up to about 1821, Paris was a city of open privy cesspits and street pollutions, when an Ordinance was passed compelling the construction of watertight and so termed hermetically sealed cesspools, which continue to this day—nuisance creators and disease breeders. Neither London nor any other English town has ever been cesspooled as Paris is—that is, by such large and costly underground structures, and as a consequence, the smaller English cesspools have been more easily got rid of; and, since 1848, they have been abolished by tens of thousands, so that London, at this day, stands sewered, drained, and freed from most of its cesspools, and is in this respect the most fully water-closeted and cleanest great city in the world. The work of entirely freeing the river Thames of sewage from Teddington to the North Sea, is merely a question of time, and there will be no further tampering with the question in London; and out to sea also must go the whole of the crude sewage of Dublin, because the river Liffey must be purified, and intercepting-sewers, having a sea outlet, will be the cheapest remedy. Every large town in Great Britain which is situate on the seashore, or on the margin of a salt-water estuary, sends the crude sewage direct to the estuaries or to the sea, and I know no valid reason against it. There are undoubtedly manurial elements of value in crude sewage, but if it must cost thirty or more shillings to utilise it by deposition with chemicals, or in land irrigation, to earn twenty shillings, I fail to see that to dispose of it into the sea at a less cost in rates is waste.

There are two modes by which inland sewage may be treated to prevent its becoming a nuisance—by disinfection and precipitation, and by broad irrigation. Now, according to the most recent experiments on a practical scale, continued over a series of years, it has been found to cost about 3,000*l.* per annum to disinfect and precipitate the sediment from two millions of gallons of sewage per day, and the material obtained by precipitation has no paying value.

To treat the sewage of the metropolis, 160 million gallons per day, by chemical precipitation would cost, at a similar rate, about 240,000*l.* per annum, and if carried on at the existing outlets on the Thames would create a great nuisance. 240,000*l.* at twenty-five years' purchase would equal a capital sum of six millions sterling, which had better be expended in taking the sewage to sea, rather than in further attempting to deal with it inland.

For broad irrigation for London sewage there should be some 40,000 acres of land available, which, at 100*l.* per acre, would cost four millions sterling, and might cost four more millions sterling to drain, form roads and irrigation conduits; but no such area of land could be purchased for so low a price, if preceding examples are to be a test. It has been found that when land for sewage irrigation purposes has been taken compulsorily, the price has, in some cases, mounted up to 150 years' purchase, and is never less than three or four times the ordinary selling or letting value for ordinary agricultural uses.

Inland towns and villages, as a rule, are obliged to secure land upon which to effect sewage purification. A long list of such towns and villages might be made out, the chief towns being Birmingham, Wolverhampton, Doncaster, Nottingham, Bedford, Leamington, Oxford, Reading, Warwick, and Croydon; to name all would be to incur this Address with a long list of mere names, which can be found in Parliamentary returns, and which is being added to. There are other towns, such as Manchester, Leeds, Wakefield, and Bradford, where sewage is partially removed by sewers and partly by movable pails, and is treated by chemicals to cause precipitation. Irrigation, or filtration through land, produces the purest effluent, and, where suitable land can be procured at a fairly agricultural price, at the least cost to the community.

On the Continent there is a sewage irrigation at Dantzic, which has been in use some years, and on a large scale it is being adopted in Berlin, where there are large areas of flat surfaces of land with sparsely occupied sandy-subsoils. To utilise sewage in the easiest and cheapest manner, the sewage should flow on to the surface without pumping. The subsoil should be porous, the climate should be dry, and have a large average of sunshine. From such land good management would produce a profit.

Public baths, washhouses, disinfecting apparatus, mortuaries, abattoirs, and a scavenging department are all necessary.

Public baths, washhouses, and disinfecting apparatus, should be as near the population for whose uses they are intended as may be practicable. They should be plain in appearance, inexpensive, and fitted up with efficient apparatus. If twenty thousand pounds has to be expended in any town, it will be wiser to construct ten separate establishments placed where they are most wanted, rather than to erect one or two imposing-looking buildings to which the poor will not go—one reason being that they are too distant. Examples of the utter breakdown of grand and costly baths and washhouses may be given. The people for whom they were intended would not use them, and so the money they cost was wasted.

Disinfecting chambers should be attached to each washhouse establishment, but isolated. That is, infected clothing should be received and washed apart. To stamp out contagious disease, burning

or disinfection of infected bedding and clothing should be prompt. It will be the cheapest process to disinfect, wash, cleanse, and restore the articles to the poor owners free of cost rather than retard the process by using compulsion and demanding payment; as, in this case, there will be secretiveness and opposition; in the other case, ready compliance and thankfulness.

Mortuaries and ambulance-conveyances are an absolute necessity in towns, and should be a part of every establishment.

Public abattoirs, situate in open spaces, well drained and ventilated, are necessary. Private slaughter-houses ought not to be permitted.

A fire establishment is necessary; and in towns having a population exceeding 100,000 there may be several stations having electric communication with the head establishment.

Scavengers' Department.—This, I consider, a prime necessity. All forms of scavenging should be under the absolute control of the municipality. There should be no private scavenging. To require householders at any time to scavenge their own premises is a remnant of barbarism, as when it is so left it never has been done, nor ever will be done. Scavenging should be done at short intervals, and every spadeful of refuse should be cleared from the streets daily, being taken to some dépôt. Such of the refuse as will burn should be burned, and other forms of refuse should be harmlessly disposed of outside the town or city. It will be a mistake to retain any refuse which is liable, by keeping, to become offensive, in the hope of selling it to make a supposed profit, as it is not the business of a scavenger to sell refuse, but to produce cleanness. In seaport towns, if refuse cannot otherwise be disposed of, it may be sent to be sunk at sea in hopper barges.

In looking over the advances made in sanitary science, it must never be forgotten that to undertake and perfect good works is one thing, but that to maintain them good is the main thing.

It must also be remembered that sewers, drains, and waterworks are only means to an end—they are only good so long as they are sound, clean, and cared for. Again, the most complete works of sewerage and water-supply may leave untouched the slums and room-tenements: and these places may remain nests of contagious disease, out of which stalk the grim forms of typhoid and cholera. There are towns in England where sewers and drains have been formed and a good water-supply established, but where scavenging and single room tenement-inspection and cleansing have been shamefully neglected. The first should be done, the latter not left undone.

In the world there is no value but in human life, and human life has the greatest value when healthy and moral. It is the aim of the members of this Congress to induce improvement, to show statesmen and the public generally that the only safety will be in assisting to remove causes which lead to sickness, incapacity, and premature death.

FILTERS FOR EGYPT.—The Atkins Filter and Engineering Company, Limited, have received an order from the War Office for 3,000 Pocket Filters, similar to those supplied for the Transvaal and other expeditions, to be delivered within a week, Lord Wolseley having telegraphed for them. The firm have also in hand an order for nearly one thousand six-gallon stoneware filters, which they are now delivering to the Woolwich Dockyard.

ON THE UTILISATION OF TOWN REFUSE.*

By LAWSON TAIT, F.R.C.S.,

Chairman of the Health Committee of the Birmingham Corporation.

FEW of the many questions which have engaged the efforts of sanitary authorities during the brief period in which real attention has been given to the care of the public health has caused so much anxiety as the disposal of town refuse. In a few favoured places the difficulties have not been pressing, but in a town such as Birmingham, the rapidity of whose growth has been almost unexampled, and situated as it is in the centre of England, with a river no larger than a brook, the difficulties and the dangers of the disposal of refuse have risen to an extent probably unknown in other large centres of population. Fortunately, in the growth of the town, land has been easily obtained, so that the population has been widely spread. Had the growth been as rapid, and the area as curtailed as in the older towns, Birmingham, instead of being one of the healthiest of the large towns in England, would probably have had its death-rate heavier than any. From its situation on the highest part of the Midland district it was obliged to adopt in its early history the system of surface household wells, and until recently these had an almost universal prevalence throughout the town; indeed, they exist now in very large numbers. In close association the midden privy was constructed, and in 1871 there were nearly 20,000 of these centres of disease existing in the borough, their aggregate area exceeding thirteen acres. As by far the greater part of the town is built upon hills of loose sand and gravel, it is perfectly needless for me to say that soakage from the privies into the wells was of constant occurrence, and is still far too frequent. Of these privies about 14,000 drained at that time into the sewers. There were about 7,000 water-closets, the contents of which, together with all the road-sweepings, manufacturers' refuse, and countless other impurities, were turned, and had been ever since the town existed, into the small river traversing its area. It is not at all surprising, therefore, that the inhabitants on the banks of the river below the town raised strong objections to its being regarded as the common sewer. Injunctions were obtained, and the municipal authorities were obliged to give an undertaking to the Court of Chancery to apply an efficient remedy. The discussion as to what this remedy should be occupied the most earnest attention of the Town Council for several years, and it eventuated in the most complete and radical change of municipal policy which, I venture to say, has ever occurred in any town. Up to 1871 the government of the town was conducted upon lines which it is no part of my business here to discuss or condemn but no one who knows the town at all but will be able to substantiate my statement that the new *régime* inaugurated by the distinguished statesman who at the present moment presides over the Board of Trade, has, as it were, reconstructed every aspect of our municipal life. The town has improved in every possible way; its death-rate has fallen nearly five in the thousand, and the average age at death has been

* Read at the Social Science Congress at Birmingham, on Sept. 19, 1884.

raised six years, and the whole of these beneficial changes are due to the inauguration of Mr. Chamberlain's sanitary policy.

In addition to the fouling of the river of which I have spoken, another and very great element of danger existed in the fact that the contents of the middens, either with or without drainage into the sewers, had to be dealt with, as well as a large amount of household rubbish, which, were left to dry on the surface of the ground around the dwelling-houses, became a fertile source of danger and death. The problems we had to solve, therefore, were only two:—How we could treat the fluid impurities which ran into the river, and how we could dispose of the solid household refuse. Up to the time I am speaking of, and, indeed, up to the year 1878, with certain qualifications which I need not enter into, the contents of the middens and the solid rubbish were disposed of partly by sale to farmers, and partly by disposal upon tips. In the early history of the town, when it covered a small area, these tips were constructed upon pieces of land which are now almost in the centre of the town, and it has been by no means an unusual thing to trace outbreaks of zymotic diseases to the accidental reopening of these accumulations of the filth of bygone generations.

During our earlier experience the sale to farmers of a mixture of ashes and excrement was a fairly profitable transaction, but they soon discovered that the material sold them possessed little real value, and whilst the amount we had to sell constantly increased, the price obtainable just as steadily diminished, as will be seen from the following table:

Date.	Boats (of 25 tons).	Average price.
1876	405	£4.864
1877	1,442	4.257
1878	1,209	3.74
1879	1,603	2.44
1880	1,791	2.246
1881	2,038	2.053
1882	2,309	2.123
1883	2,397	1.7

The difference in price from 1876 to 1883 of 2,397 boats is 7,990*l.* The farmers, in fact, found that whilst the ashes clogged the land, the amount of fertilising material was so small as to be hardly worth the labour of application. We, on the other hand, found that not only was the price to be obtained for it constantly diminishing, but that the difficulties and cost of its transport were constantly increasing. The outlying rural districts in the immediate neighbourhood of the town, which were governed previous to 1875 without any kind of reference to sanitary work, were constituted into sanitary areas, with boards of management, who speedily found that it was not to the interests of their constituents that accumulations of this material should be allowed to lie on the canal sides within their boundaries. The canal companies, too, began to raise difficulties about transit, and about the damaging nature of this particular kind of traffic alike to their trade and their property; and the immense importance to us of this difficulty may be, perhaps, best summarised when I say that in the last few months one of the canal companies has given us notice of an increased tariff, which would, on our transactions of the previous year, mean increased payments of between 4,000*l.* and 5,000*l.* per annum. Finally, let me say that the difficulty in the deterioration of the value of this crude manure

upon the amount we now produce represents a difference of income between 1876 and 1884 of more than 20,000*l.* a year.

The Health Committee, under whose direction all this work is carried on, has been more than once adversely criticised about an undue increase of their actual expenditure over that for which they have estimated, but it is perfectly clear that in the conduct of such a business as this nothing like even an approximately exact estimate can be formed, and whilst actually their greatest excess of expenditure over estimate was 3,342*l.* 17*s.* 10*d.* on a total expenditure of nearly 45,000*l.* a year in 1883, the committee have frequently been under their estimate, and the wonder is that a statement in any degree approaching accuracy can ever be made. The diminution of income on the old method of working is perhaps best seen by the following column of figures, which gives the total receipts from the sale of crude manure between 1877 and 1880, in which latter year a more scientific treatment of the town-refuse was introduced, and these figures indicate the very advantageous results during the last three and a half years obtained from the new method:—

Years.	£	s.	d.
1877	11,212	12	0
1878	11,556	1	11
1879	8,339	18	4
1880	7,879	1	10
1881	10,141	3	2
1882	11,622	3	3
1883	11,553	4	11
1884	14,000	0	0 (estimate)

From the figures I have given, which are, except the last sum, actual cash results, it will be perfectly evident that if the old system of mixing ashes and excrement for the purpose of sale had been continued and extended, nothing but bankruptcy could have resulted for the department.

The problems we had to solve were only two in number, and they were extremely simple in character; but they were extremely complicated, from the enormous bulk of the material to which they had to be applied, and it is from this chiefly that our progress in their solution was so slow. We found, in fact, that theoretical chemistry was of but little help, and that laboratory experiments were absolutely futile. We found that no results of a trustworthy character could be obtained unless the experiments were made upon a scale which would represent a considerable fraction of the material we had to deal with. We were therefore obliged to proceed slowly and with the utmost caution, and, looking back upon the fact that we could find absolutely no experience anywhere which we could apply to our own work, it becomes more and more astonishing to me that we made so few mistakes as we might have to place on record if an account of them were demanded. We sent out inquiries, and we visited by deputation all the large towns in Great Britain which were in any way comparable to our own, and these inquiries and investigations, concurrently with our experiments, occupied a period of nearly seven years. As they advanced, and as the results of our experiments became more accurate and more extended, the more certain did we become that the original conclusions established by the report of the Birmingham Sewage Inquiry Committee were those alone which were applicable to our town. The recommendations were as follows:—‘The exclusion of animal excreta from the sewers is, in the opinion

of the committee, essential both to the effectual treatment of sewage and to the health and comfort of the population, and they have arrived at the conclusion that this object may be attained by a reform of the system of exposed privies and open middens now prevailing in the town, and which defile the air, poison the water, and, by means of connecting drains, pollute the sewage.

The first principle we established, and we arrived at it chiefly from the disastrous experience of other towns, where it had not been adopted, was that it was absolutely essential to keep the two elements with which we had to deal—the household refuse and the excreta—entirely separate, and for this purpose we established a system of dual and joint collection which has proved perfectly satisfactory. In the reconstruction of closet accommodation we filled up the old middens and replaced them by simple closets, under the seats of which we placed large galvanised pans. These pans are coated inside from time to time with boiling tar, an operation which very much diminishes the smell and enables them to be easily cleaned. Somewhere near the closets are placed ash-tubs, either of wood or iron, into which the tenants are requested to place their household refuse, and they are strictly forbidden to empty slops into the pans. It took a long time to educate the population to the fulfilment of even these simple directions, and much trouble was encountered for several years in establishing the fresh arrangement. We found that many people objected to it, and clung with a mistaken but most affectionate pertinacity to the foul middens to which they had been accustomed. The arrangements for the collection of the pans and ashes were at first defective, and a good deal of outcry was raised from time to time against the objectionable smells which they emitted as they passed through the streets; but as the details became perfected one after another these objections ceased, and we were not troubled with any complaints. Indeed, the complaints now are all against the old system, for when the remaining middens have to be emptied the overwhelming stench which prevails all over the neighbourhood for some hours after the process is a never-failing theme of complaint for exactly the same people who, when they were accustomed to its nightly recurrence, thought it hardly worth mention.

The collecting vans are arranged to carry eighteen pans and about one ton of ashes, and the collection is made from each house on the average once a week. When the pan is removed it is covered by a lid, made to fit perfectly tight by means of a strong spring and a band of India-rubber, so that any smell is avoided. The ash-tubs are emptied into a special receptacle at the hinder part of the van. These vans are taken to our central dépôt, and there are subjected to processes of which I shall shortly speak.

Two objections have been and may be urged against the process, so far as I have described it. The first is of an unimportant character, the second of very great weight. The first is that as the work has to be done during the night some amount of noise is made at the back of each house once a week, but I venture to say, and I can speak from my own experience without any hesitation, that this is a very much smaller evil than the noise of emptying one of the old middens, which sometimes went on for hours, even though this occurred only once in several months. The outrageous stench which accompanied

this process was sufficient to induce one to be away from home when it occurred. The second objection is the cost of the collection, which is very heavy. The answer to it, however, is that the material has to be collected, whether it is deposited in tubs or middens, and when it is collected from middens it has to be removed out into the country at an additional cost, which more than doubles the cost of collection. If, on the other hand, it is collected in pans and tubs on the separate system, not only does the cost of collection practically end the loss which is sustained on it, but its further treatment on the plan I have to speak of contributes (as I hope to show) to a very remarkable extent to a set-off upon the cost of collection. Upon these grounds, therefore, in estimating the financial results of our proceeding we do not take in the cost of collection at all, because it occurs equally in both accounts, and therefore as a common factor may be entirely eliminated. We proceed, then, to discuss the whole question at the point where the material, of whatever type, has been received at the places we call wharves. There are several of these throughout the town, in all but one of which the old process is carried on; and it is to this one exception that the interest of what I have to say applies.

Whilst our system of collection and the details of reconstruction were being applied to the town, the amount of material collected at Montague Street far outstripped our powers of dealing with it by a scientific process. It had, therefore, to be converted by a primitive process of manufacture into what was practically the old midden stuff; and the only advantage we obtained so far by our new arrangement was that we had one huge midden in Montague Street in place of the thousands we had removed from the general area of the town. It was not difficult to imagine that this arrangement was extremely unsatisfactory to the inhabitants of the immediate neighbourhood of Montague Street wharf, and it increased the cost of the department very materially without any tangible gain beyond the increase of the health of the community. This increase of cost, together with the increase of population during the years in which the pan system was being extended, and the materials roughly manufactured was displayed in the following column of figures:—

Years.	Expenditure.			Population.	Cost per Head.	
	£	s.	d.		s.	d.
1877	33,356	15	5	377,436	1	9
1878	35,101	3	0	383,117	1	10
1879	40,446	14	1	388,884	2	0

It will be seen that the continually increasing cost of collection and the continuously diminishing value of the material again gave indications that the continuation of that policy would have been ruinous. At this point it may probably be convenient to anticipate a criticism which is sure to be raised upon the general system of our policy for the disposal of refuse which has been adopted in Birmingham. Towns will be pointed to, of great importance and large size, in which no such costs as these are incurred, and instances of towns where the water-carriage system is in use will doubtless be specially indicated. We may, and probably will, be asked the question, Why has not the water-carriage system been adopted in Birmingham? and there are some amongst us still, I am sorry to say, who are disposed to take such a retrograde step. I need not answer the objection in detail, because the

answer to it will be found in the volume I have already quoted, the report of the Birmingham Sewage Inquiry Committee. Suffice it to say generally that as Birmingham has a very elevated position we cannot obtain a water supply by gravitation. Every ounce of water used in the town, unless obtained from a soft water cistern placed on the roof of a house, has to be pumped, and the public supply has to be raised from 200 to 600 feet, and I need not say that not only is this an extremely costly process, but that the quantity we can obtain, and from reservoirs, is such as is calculated only for the maximum requirements of a constantly growing population for all purposes exclusive of a water-carriage system of sewage. It is extremely doubtful if we could obtain in any way the additional quantity of water required for this purpose, and even if we could obtain it our difficulties would be increased instead of diminished by every gallon of water-closet liquid which was added to our already enormous bulk of sewage. It is stated in the report already quoted that in 1871 the dry weather flow of sewage was seventeen millions of gallons, and that the stormy outflow amounted to thirty-two millions of gallons each day, and from the very considerable increase of population, and the far more extensive processes now in existence, the probability is that these figures would now stand respectively at twenty millions and forty millions of gallons, all of which has to pass into a small brook. It is perfectly true that very large tracts of land have been purchased, and have been drained for the purpose of clarifying this enormous bulk of polluted water, but it is equally true, on the other side, that in the constitution of the Birmingham and District United Drainage Area an enormous additional area, with a very large population, has been embraced within its operations, the drainage of which will have to be passed over this land.

Looking at the condition of the river at the present moment, it is not difficult to believe that so far as the operations of the Drainage Board have proceeded the question of the clarification of the river has hardly been touched, and I may say that all the land they have will be absolutely ineffectual for dealing with the sewage during at least nine months in the year. Besides, there are three additional arguments which can be urged against any departure from the policy commenced in 1871 and consistently maintained until the present moment. The first is that when excrementitious matter is added to water it is absolutely impossible effectually to remove it by any process short of distillation. It is equally certain, as proved by the Sewage Inquiry Committee's report, that huge bulks of diluted sewage cannot be applied with any kind of economy to land, however extensive in area, and that the crops grown upon that land, such as rye grasses and the coarser kinds of vegetables, cannot be sold. The third objection is that human excreta contains so much valuable fertilising material that they constitute in themselves a perfect manure of great value for certain purposes. We can say further, from an experience which is now pretty extensive, that when they are reduced to a form in which they can be stored or transmitted to a distance, or applied directly to the land without further manufacture, they command a ready and profitable sale. The conclusion is, therefore, that the true economy is to preserve from waste these materials which, having

been taken from the land, should be restored to it, and that it is a mistake to waste them by such dilution as renders them practically valueless. In fact, in such an uncertain and moist climate as we have to contend with, the true principle for the utilisation of this kind of refuse is to remove from it all excess of moisture which it already contains, and certainly not to diminish its value by adding to it a useless and damaging excess of water.

Acting upon these principles, the plan we adopted was to act upon the one kind of refuse by means of the other. Immensely to our surprise, and to our no small satisfaction, we found that the solid ash-tub refuse, which amounts to 72,000 tons per annum, would burn in properly constructed furnaces without the addition of any other kind of fuel, and in this burning it is reduced to one-fourth of its original bulk, and the result is a peculiarly useful silicious clinker, which we turn to all kinds of useful purposes. It has been used to erect buildings with, to make roads and paving blocks, staircases, horse-troughs, tables, and ornamental fireplaces, samples of all of which may be seen at our works. Of this kind of household rubbish there has been about eleven boats per week sent out into the country, the mere cost of transit being 500*l.* If we burn the same amount the cost would be 270*l.*, and if we used all the clinkers, as we hope to do, we should save 230*l.* The burning of this amount would occupy three furnaces of the kind we have erected for the purpose, and of the total bulk of the rubbish thus burned 75 per cent. would be dissipated in the form of heat. From the figures I have just given it would clearly be profitable if we merely burnt the rubbish, and did not in any way utilise the heat; but there is no physicist, certainly no manufacturer, who is not perfectly aware that one of the greatest advances of modern times has been in the utilisation of the waste energy which has a constant tendency to be dissipated in the form of heat. The loss would therefore be enormous if we allowed 75 per cent. of the energy contained in the 72,000 tons of this rubbish to be annually wasted.

In order to utilise this waste heat the plan adopted by the Health Committee was to apply it for the removal of moisture from the contents of the pails. The means by which this is done is extremely simple. Boilers are placed in the furnaces, and the heat is transferred by means of steam to large machines, of which a working model is here exhibited, into which about sixteen tons of pail stuff is put as a charge with sufficient sulphuric acid to fix the ammonia. A hot-air blast from the furnace flue is drawn through the machines by means of a blower. The steam is applied by means of a steam-jacket and hollow rotating spindles, and in from sixteen to twenty hours the sixteen tons is reduced to one ton of solid poudrette, containing from 7 to 9 per cent. of ammonia, according to the time of the year, and from 2 to 3 per cent. of phosphates. Without any further treatment or addition this forms an admirable manure for top dressings, and for all kinds of rapidly-growing roots, particularly the beet-root, and in the growth of those vegetables for the purpose of sugar manufacture this kind of manure has been found extremely valuable, and doubtless it will also have a ready sale for sugar-cane and cotton.

Concerning its commercial value no absolutely certain statements can be made. So long as we were making ten or fifteen tons per week, and until we

sified we could make a much larger amount, or very energetically enter into the question we could obtain for it. We were quite to hand it over to a large firm of artificial manufacturers, who took all we made at 5*l.* without any reduction for carriage. When it rose to twenty and twenty-five tons per is firm found the quantity larger than they al with, and we accepted a temporary re- of price to 4*l.* a ton. During the last two however, we have been making efforts to ther markets and a better price, and we o difficulty in getting 5*l.* a ton—in fact, we n able to get as much as 7*l.* 10*s.* We also the Corporation of Warrington can com- steady price of 6*l.* 10*s.* per ton for exactly : material.

our estimates of profit and loss in dealing refuse, we found it convenient to take one il stuff as received at the wharf as the unit ent. On the old system we found we lost every ton we collected. In the winter of when our machinery was very incom- d only on an experimental scale, we were duced our loss to 3*s.* 9*d.* per ton. In 1883 cted nearly 18,500,000 of pails containing ns of stuff, and we estimate that if all this were manufactured into poudrette, and sold on, the actual loss of 10,400*l.* a year would d into an actual profit of 17,000*l.*, giving a ference of 22,000*l.* a year. As a matter of en we sell the poudrette at 4*l.* a ton, we profit, or, to speak more accurately, we our loss on every ton of pail stuff collected tent of 9*s.* 2*d.* If we obtained a constant 5*l.* a ton, the diminution of loss would be and if we obtained the Warrington price, nution would be 12*s.* 6*d.* a ton, and there o doubt that these sums would immensely with an increased output, because we are lly conscious of the experience of all manu-, that there is a constant tendency towards on in the cost of production just as the pro- ncreases in amount.

Conclusion, let me say that whilst I am per- tified that the financial gain to the borough e from 14,000*l.* to 17,000*l.* a year, according ice obtained for the manure, there is no at these estimates are to a considerable eculative, but there is no speculation in the t that we should save for the community a of valuable material which is now abso- isted; and there is considerable consolation fact that, whilst, as I have said in the g of this paper, our estimates never can be th anything like exactness, yet we have been ly justified by results in placing our estimates receipts on the sale of manure largely in of those of last year. In 1883 our total were 11,553*l.* on the sale of manure, against n 1880, that is, before we began to sell e. For this year we estimate our income s source at 14,000*l.* On July 31 we had 7,069*l.*, and had 400*l.* due for stock in f delivery. As the best part of the year for has yet to come, and as we are quite con- can obtain an increase in price, we feel that on Dec. 31 our estimates of income : source will be completely justified.

EDUCATION BY PROVERB IN SANITARY WORK.*

By ALFRED CARPENTER, M.D., M.R.C.P.Lond.,
C.S.S.Camb.,

Chairman of the Council of the Sanitary Institute of Great Britain.

THERE are two points in the study of the causes which shorten human life, which must strike all thinkers upon the subjects of health, of disease, and of death. These points may well form the commencement of my address to the earnest sanitarians who are now assembled in this city of Dublin.

The first of these points is the sacred feeling which attaches to human life, to the spiritual essence by which we live and move, and have active existence, and which feeling is instinctive in the breasts of all who may be assumed to have had the privilege of a spiritual contact with the Supreme Being. This spiritual essence being a something altogether different to that life which belongs to animated nature, exclusive of that attached to humanity.

The second is the carelessness with regard to this same life, the indifference with which its extinction is regarded by barbarians and uncivilised communities, and also by a portion of the civilised world, who ignore the existence of a Supreme and Benevolent Architect of the Universe. The more uncivilised the race, the less is the respect which is paid to the maintenance of human life. There are still nations upon the face of the globe who, when their parents or relations become old, or labour under any distemper which cannot be cured, cut short their days with a violent hand, in order to be relieved from the burden of supporting and tending them: and there are yet some countries in which the children are destroyed when not wanted, much as we destroy whelps and kittens in our own land. I have even in my own day, in our own native country, heard it represented that it would be an advantage to the State, to the locality in which they live, and even to the poor creatures themselves, if some of the inhabitants of our lunatic asylums, our prisons, and our workhouses, could be put to death in some painless way, by which their sufferings could be shortened here, and the expense which their maintenance entailed upon the community altogether avoided. There are also men who boast themselves as being among the highest of intellectual beings who would deal in a similar manner with the habitual drunkard, by placing within his reach as much as he wished to take of the baneful poison which destroyed his health, with the object of hastening his departure from among us, and so saving the State or his personal friends any further trouble and expense on his account. These individuals are but evidence of the brotherhood which exists between some of the tribes inhabiting the Chinese Empire, or of the interior of America with these same intellectual beings among Queen Victoria's subjects, who, like the barbarians referred to, ignore the sacred character of the vital spark, and have no idea of a future state. In this part of the world they call themselves philosophers, and style the subject a study of the Euthanasia.† But the sacred character which attaches to human life is not likely to be extinguished among us, and whilst the instinctive

* Lecture delivered at the Congress of the Sanitary Institute of Great Britain, at Dublin, Oct. 1884.

† Meaning an easy departure and utter annihilation.

feeling which belongs to humanity, arising from spiritual contact with a higher power, has sway, we are not likely to degenerate to a class of low utilitarians, or become the supporters of a principle of a cynical selfishness. A nation or a class encouraging a feeling which diminishes the sacred character attached to human life is a degenerate nation or an uncivilised race. This cannot be said of either the Celt or Saxon as a race, though some among us give utterance to doubtful principles. If there is one thing more than another which is uppermost in men's minds in this our day, and in our own land, it is as to how disease may be impeded, how our children may be preserved to us, and how we may attain to a length of days which statistics have told us should be ours, but is not. It is only within this present century that Society has been made aware of the loss which accrues to the community from the premature deaths of immense numbers of its atoms: personal interest is brought forward in support of humanity, and the welfare of the State is shown to be also in accord with the sacred feeling which protects the life of its citizens. Although the people generally had not been aware of this loss until very recently, it was well known to wise men in all ages, and imputed by them from various motives, either to the anger of the Supreme Being, or of those who in the more degenerate ages of the world represented Him in the public mind. The tenth plague in Egypt, in which the death of a child in every family was the natural result of a disobedience to sanitary law, ultimately led to the promulgation of the first set of sanitary edicts with which we are intimately acquainted, and which were made binding upon the Israelitish people by being engrafted upon their religious performances. It is thus that the wise men of old were enabled to 'save some' by means of Proverb or religious dogma, and the sanitary observances inculcated by Moses in the wilderness of Sinai were based upon his acquaintance with the evils of town life, and the disadvantages to the State which a residence in the closely confined cities of Egypt had brought upon the Hebrews. The forty years' wanderings in the air of the desert purified them from the diseases which had debilitated their frames, and which the fleshpots of the valley of the Nile had assisted to cause. The rules laid down by Moses, whilst they prohibited a continuance of the people in a nomadic life, also prevented those evils from arising which were sure otherwise to follow upon overcrowding and its natural consequences in the confined cities of Palestine. Moses was well acquainted with the selfishness and with the egotistical and mercenary spirit especially belonging to one side of humanity. He took measures, therefore, to inculcate sanitary truths by making them into edicts of the State, unalterable by the whims of the people, and this led them to be observed as long as the Mosaic law was the law of the land. Moses and other wise men of old studied human nature; they recognised the difficulties which were in the way of establishing healthy action, and pointed out to their disciples that health followed upon obedience to certain laws. They knew that self-indulgence, sloth, and the love of money, were stronger moving powers in the minds of the masses than benevolence, than industry, and virtuous abnegation of self. The spirit which led Moses to lay down the laws in the Mosaic precepts, which are the basis of all sanitary codification, led to the popular association of Proverb in sanitary work.

The same moving spirit caused the priests and priestesses of the temples of the gods of the heathens to give utterance to sound sanitary directions, veiled in dark sentences, and accompanied with rites and ceremonies tending to exercise the imagination, and to lead their devotees to carry out their behests in blind obedience, and without thought as to the reasons for their orders, or any reference to the God of Nature in the work to be done. But being myself an earnest believer in natural law, I understand Nature as being in the words of one of our poets, not only in the material and visible world—

In the round ocean, and the living air,
And the blue sky (*but also*) in the minds of man,

and that all actions which take place in the world, all changes of matter, and all the results of such, are caused by laws implanted by the Divine Architect of the Universe, in imponderable as well as in material agencies. I believe that the former, though invisible and unweighable, are infinitely more powerful than the latter; that the material world and its inanimate matter is acted upon by the immaterial and the spiritual world, through animated nature, in various ways, which may be beyond our conception, but which nevertheless are according to general laws, and that it is always in accordance with a law when disease of any kind appears, and life is taken away.

It is the object of the sanitarian to find out the forces, as well as the material agencies, which bring these laws into play, especially as regards those forces which influence the health of the people, by means of which life is prolonged or shortened, and the atoms which go to make up a population increase in number or diminish and vanish away. We ask, and we are sometimes able to find out in answer to our question, why those enormous animals which formerly inhabited the earth; why the megatherium, dinotherium, the mastodon, and the Irish elk have departed from amongst us; and coming nearer to present times, we ask why the Aztecs are gone, and the Red Indians are likewise becoming extinct, following in the wake of the elk and the moa, whilst the Celt and the Saxon are spreading all over the world, and showing their superior mental and actively constituted bodily powers in every portion of the earth, and spreading abroad a knowledge of the sacredness which attaches to human life. A belief in natural law, as far as the people generally is concerned, is a belief of modern growth, it is one of the pillars of sanitary work, the other has sprung out of the Christian tenet that we should love our neighbour as ourselves. The term supernatural is still considered as a reality by many, but it is obsolete and altogether out of date to the sanitarian in all things connected with health. If anything arises which is new, or rather which is observed now for the first time, or which is incomprehensible to him, the sanitarian believes it to be the result of some law, the nature of which is at present hidden from his intellectual understanding. If it has reference to the health and well-being of the people, he sets himself to solve the mystery, and to find out the bearings of that law which has brought about the apparently incomprehensible result; and whilst acknowledging that all things which happen are the sequences of Nature's laws, the sanitarian declines to regard anything as supernatural or beyond the power of man, to influence, sooner or later, for either

good or evil, if means are taken to effect the object he has in view.

For instance, an advanced sanitarian declines to look upon disease, or even upon death, as supernatural, and some of us dare to assert that death, when caused by disease, is not a necessary sequence in man's history. I, as a sanitarian, dare to assert that death, as it ordinarily occurs, is a preventable event, and that disease need not be the cause of death; and in effect I support the views held by those who uphold a belief in revealed religion, that disease is the sequence of man's degradation and fall, and that a restoration to right paths will be followed by the removal of its effects, and with its removal the sacred character which attaches to human life will be made still more manifest.

The sanitarian's study is man's mental as well as physical state; he is able to make out the effects which are produced upon his material body by immaterial as well as material agencies. Both have influenced his actions and his affairs from his first appearance on the earth. He finds that the acts of man are governed by natural laws; that they are often the sequences of acts which were performed by generations who existed in ages long past, and which acts are not ordinarily thought of as having been the causes of those results, and no country in the world gives such proof of the truth of this adage as this Ireland, in which population is decreasing and public health at a comparatively low ebb, whilst the sacred character which belongs to human life is not set at so high a rate by some of its inhabitants as it is on the other side of the Channel.

The sanitarian judges by analogy, and knows that the men of the present day will influence their successors hereafter in a similar manner, if corresponding acts are performed by ourselves. He can prove this fact by irresistible evidence, based, it is true, upon analogy, but the sequence of events, like the rising of the sun to-morrow morning, is all but certain. He appeals to you to assist him in taking such measures as shall prevent similar results in the future, when they may possibly produce corresponding evils to man. There is no proverb so well established as that of 'Prevention is better than cure,' or, as the old Roman expressed it, 'Præcipiis obsta;' and to it I appeal as one of the bases of my remarks.

The sanitarian shows you that whilst a few years ago the average age at death of all persons who died in a given period of time in some of our towns was not more than twenty-five years, and that some districts in Dublin at this moment show a similar rate in the length of life of those living in those districts, whilst in others it is thirty-five or forty; and that which is called, in irony, Civilisation or Culture, is partly responsible for the gradual decrease in the length of days of man's life upon earth; for the shortest average lives were in the most crowded, but also the most highly civilised cities. We are able to show you now that the average age of man at death has risen within the last few years to over forty-one (the whole kingdom being considered), whilst in some given districts it rises to sixty; and we assert that this increase in the length of life is due to sanitary work: to a better knowledge of the causes of disease among the people, and the removal of those incidences which belong to a neglected poverty.

We ask, Why should conditions exist in some of the bye-streets of Dublin, of London, and of Liverpool, or Glasgow, by means of which the average

age of those who die there is considerably less than thirty, whilst the instances in which life has been prolonged to 100 are numerous even in Ireland itself? The sanitarian asks, If Biddy Sullivan could live till after her ninety-ninth birthday, why should not the same result happen to every other person born in Ireland? Every sound seed produced by a given plant can be cultivated and made to produce another of the same kind if proper measures are taken to bring about the object in view; it is only a barbarian plan which leads to a so-called survival of the fittest. The sanitarian asserts that Bridge: Sullivan did not die, in the ordinary sense of the term, from disease. There was no apparent disease in her frame; there was evidence of age, which showed itself in the white hairs, the dim sight, the hardness of hearing, and the want of taste, which came on in the last few months of her life, like changes of colour which take place as a cornfield approaches the time of harvest; but those conditions arose from failure to carry out certain attributes which belonged to the material body. They were not attended by pain, and when life ceased to be, Biddy Sullivan shuffled off the mortal coil, and joined the majority without suffering a pang of any kind. I have in my time watched many and many a death-bed, and in the fact of death itself, as separated from the disease which has brought on the premature ending to mortal life, I am satisfied that pain is not and need not be a part of the process. There is no more pain in dying than in being born into the world; uneasiness connected with spinal actions there may be, but pain is no part of the process. 'I am in no pain,' has been the answer to my question hours before the end has come: the departure has taken place, the separation of soul from body has been effected without a pang of any kind. Pain is a consequence of disease. The end of mortal life on earth will come, but disease need not be its precursor, and death therefore need not be regarded as painful if disease is prevented. Bodily pain is the evidence of some abnormal action which is interfering with the ordinary course of nature; it is a danger-signal exhibited by the nervous system to show to the owner that some law has been transgressed, and some change effected in the nerve battery which regulates organic life, which has led to changes not consistent with health and freedom from suffering. Pain is the manifestation of a warning on the part of organic life which should cause the sufferer to alter some course of proceeding tending to set up mischief, or it is the necessary sequence of things in a return to a right and healthy path.

It is the object of the sanitarian to bring about conditions which diminish the frequency of early death, which assist to remove bodily pain from the list of human grievances, and to pave the way for that time when every person born into the world will enjoy his birthright without having it curtailed by the acts of other people. Every child born into the world has a right to live to the natural end of his mortal life, and, whatever is taken away from that one hundred years which is his birthright, is so much fraud upon him; and is so much enjoyment upon earth of which he has been robbed. The development which should be the result of that enjoyment has been prevented, and his hopes of a future and a brighter world possibly taken away, or if his sojourn is attended with suffering here, the pain endured is so much of the fire of affliction which helps to purify

the spiritual being and prepare it for that brighter world beyond the grave. A just and benevolent Maker will no doubt rectify this in some way beyond our ken, but the fact is there. That length of life which was attainable by Biddy Sullivan—viz., close upon a century, is the birthright of all of us. We do not attain to it because our forefathers did that which was right in their own eyes, without reference to the effect of their actions upon their descendants, as well as upon those around them: or our neighbours, or we ourselves, do acts inconsistent with its continuance. Our forefathers were ignorant of the influence their conduct would have upon their descendants. The sin of omission will not be so great to them as it will be to us, who have the illumination of the present age to guide us.

'*Salus Populi suprema lex*,' is a very old proverb in the cause of sanitation. It was a Roman saying when the commonwealth was the first thought of the true statesmen of that old republic, when a few great men cared for their country more than for their own pockets, and preferred its welfare to that of their own comfort; but the teachings of the proverb have had until quite recently but little force in the larger part of the United Kingdom, and certainly less in Ireland than across the Channel. That proverb in later times, however, has been more often used for purposes of persecution than for the public benefit, and any good effects which it might have had have been much more than counteracted by others which have shortened life and propagated disease, but which, curiously enough, in the abstract are looked upon from very mistaken ideas, as essentials to the Magna Charta of liberty. 'A man's own house is his castle,' and 'Every man has a right to do what he likes with his own.' These unpatriotic proverbs, taken in a practical sense, have injured man's constitution and damaged the framework upon which man's body has been built, by being applied to his own purposes by the ignorant, the designing, the selfish, the vicious, the miserly, and the indolent. Instead of being applied as protections against evil, they are opposed to true patriotism and the general welfare of the people, they have been used for the manufacture of evil, and the multiplication of foci from which disease has been spread, and life taken away from its owners; they are therefore quite antagonistic to the sacred feeling which ought to belong to human existence. They have shortened man's life, have weakened his intellect, have diminished his muscular power, and have sometimes caused his descendants to throw themselves under the Juggernaut car of an imaginary destiny, as if there was no escape from its consequences, no help for unhappy mortals from the sufferings of disease or the pains of the consequent death. The disciple of sanitary law has a better knowledge, he knows that man's destiny as to disease is to some extent in his own hands, unless his system has been tampered with by acts of his ancestors or the laches of himself or of his neighbour, or neglect of the State, in which cases he is somewhat hampered by mortgages which will have to be paid off by himself and his descendants. Notwithstanding this the sanitarian sees in the dim distance the realisation of his hopes, and with the Prophet Isaiah he believes that the days will come when 'There shall be no more an infant of days, nor an old man that has not filled his days, for the child shall die a hundred years old.' (Chap. 65, v. 20.) But 'that the sinner being a hundred years old shall

be accursed.' He sees an actual felicity in sanitation, as expressed by my predecessor in the address which he gave to the Congress at Glasgow, and which felicity may be looked upon as supernatural by the unlearned. The sanitarian sees the time when the knowledge of the sequence of God's laws shall be spread broadcast throughout the world, so that the consequences of a man's acts shall be as visible to himself and his friends as they are even now to the pathologist and the physician; and seeing the effect of those acts upon the frames of other men, he shall be careful to avoid corresponding effects by not committing the mistakes which may have led to their production in himself, in his descendants, or in his neighbours; for heredity in disease, or a deficiency in muscular and mental power is as certain to accrue to men as it is found to do among the lower animals of creation as regards form and other attributes. It may be in the early future, it will be some day, that persons will become ashamed of having to acknowledge themselves to be the subjects of complaints, which instead of, as now, exciting sympathy and condolence will be looked upon as blots upon the family scutcheon, and as such to be got rid of or hidden out of sight, and certainly not to be flaunted in the face of a more discerning world than is the present in matters of health. Men will then look out for their life-long companions from among those who are possessed of rude health, who belong to stocks enjoying long life, and from among the intellectually superior, from those with a pure blood and free from hereditary taint, such possessions being of more value than money or position, or even an evanescent beauty, a highly-strung temperament, or a hysterical sensitiveness, which is but too often the evidence of an inheritance from a gourmand, a drunkard, or a vicious man. We ought to look forward with pardonable desire to the time when defects in bodily health will be remedied, not as a man with one leg naturally remedies his defect by taking to a wooden one, but by using measures which shall remove the defect itself, and education of the young will then be on developmental principles. We find, in my own profession, a number of practitioners who fail to see this necessity, when they provide substitutes for a defective faculty in the young and growing youth, instead of rightly cultivating that defective faculty and bringing out its hitherto dormant powers. Spectacles for growing children, straps of all kinds in dress, high-heeled boots, and tightly-fitting corsets, will be sent to limbo, and foolish young people not allowed to go on in wrong lines.

I have used the term destiny with a motive. It is a term which has influenced millions who have surrendered themselves to its sway, and allowed themselves to be unresistingly carried on by the ever moving stream of time. They have been ignorant of the fact, or they have forgotten that the laws which govern matter can be directed by the will of man, and that the order of those laws can be changed by the power of that will. It has been forgotten that the will of man is in his own power so long as he holds the reins, but that if he surrenders those reins to others or throws them away because the exertion of that power is a trouble to him, because it is easier to go with the stream 'as one sheep follows another,' and 'one fool makes many,' he becomes the slave of a myth, and helps to add to the evil which is in the world, instead of

that evil and doing good to his own generation is especially the type of the hysterical sentiment of the present day, and which is sadly increase, being the inheritance which comes from the winebibbers of former times. If a stone in his hand he can throw it, or not at some object as he pleases, but, having it, the matter obeys the immutable laws along to matter, directed, it may be, by the man to some object, but, having left his power, is no longer under his control, and deflected from the path which he intended it and ricochet from the straight line, and strike, or even like the boomerang return and him who threw it. And as we read in the an'—

sted nail placed near the faithful compass
 swinging it from the truth, and wreck the argosy.
 sanitarian believes that he can, by using
 ans—

Turn the stream of Destiny,

Break the chain of strong necessity,
 as Spencer sings)—

as tied to Jove's eternal seat:—(*Fairy Queen*.)

sanitarian does not believe in the permanence of literary evils.

not my intention to stay long in the distant wander away in the cloudlands of psychostudy, but I want you to bear with me whilst at the time when knowledge belonged to when the tendency of the human race in life was to become depreciated in value by luxurious habits, by gluttony and other self-indulgence, scarcely counteracted by rival of the fittest; when writing was not and tradition the principal mode of transknowledge from one generation to another. man had become a transgressor, and had influences affect his frame. Those men who were completely developed, and were wiser than their fellows, marked the effect of the unknown which upon the fears of the weaker sort, and the sequences of nature's laws to the super-as if caused by the anger of the gods. assumed a power to intercede for the offenders, to turn aside 'the bolt of Jupiter.' Knowledge regarding the true nature of the Supreme as limited to few, and those few often used knowledge for their own benefit. The fears of the people were used for the purpose of turning that knowledge to profit. As a semi-civilisation again established and a theology developed, the of the gods became powerful agencies for the promulgation of dogma both true and false. Some dogma was used for the promulgation of false principles. This was the case when power was in the hands of benevolent men; too often, despotism was simply a means by which the masters of the place held power over the people, and it was only when a truly wise and man like Solon or Moses was in the seat of power that advantage accrued to the people themselves instead of being used for the benefit of the few. Sometimes it happened that wise men studied the weaknesses of the people, and used those weaknesses for the purpose of inculcating right principles, and this is not uncommon among statesmen in our days. Faith in the supernatural among the

masses enabled them to do this by means of proverb. The promulgation of edicts took the form of religious dogma, and their authors worked upon either the fears or the faith of the people. These attempts to influence them were often made in times when pestilence was at work, and men's minds upset by the dread of an unknown future. Learned and benevolent men wished to bring them back to be influenced by those physical laws, the effects of which were altogether unknown to the masses. Dangerous and rapidly fatal diseases tended to strengthen the power of superstition among them. There was a good side in the means taken, but it had an evil tendency, and it was to that which Buckle refers in his 'History of Civilisation,' where he says, 'The real mischief was that it engendered in the mind associations which made the imagination predominate over the understanding, which infused into the people a spirit of reverence instead of a spirit of inquiry, and which encouraged a disposition to neglect the investigation of natural causes, and ascribe events to the operation of supernatural ones.' ('History of Civilisation,' Vol. I., fol. 115).

The effect of this mischief is well expressed by the Israelitish proverb referred to by the prophet Ezekiel, 'The fathers have eaten sour grapes, and the children's teeth are set on edge' (chap. 18, v. 2). In this proverb we have a distinct reference to hereditary tendencies, and to results which require much hard work to reverse; it applies to ourselves as well as to the ancient inhabitants of Palestine, and hereditary tendencies are some of the most difficult problems which the sanitarian has to deal with. I want to impress this fact upon the minds of my hearers, to point out that whilst cholera and fever, smallpox and scarlatina, diphtheria and erysipelas are undoubtedly immediately preventable diseases, yet prevention is not limited to those classes, but that insanity, tuberculous diseases such as consumption and scrofula, cancer, hysteria, and deformity of body and even of mind, as shown by passionate and vicious conduct, are also equally preventable, if we did but know how to proceed in order to stay their incidence. It was about this time that the real father of physic, and, I may say also of preventive medicine, made his appearance in the world, for it is only in recent years that we have realised how much was understood by Moses in this direction. Hippocrates owed his knowledge of physic in a great measure to reading the tablets which were put up in the temples of the gods. These tablets contained accounts of diseases from the effects of which certain individuals had recovered, and also an account of the means whereby the recovery had been promoted. Hippocrates lived about 500 years before the Christian Era; he is said to have died in his 100th year. He was a grand writer. The chapter upon the diet of healthy people may almost be taken as a string of proverbs, and, as such, was committed to memory and observed by his disciples; whilst the aphorisms which he formulated as to the conduct and treatment of diseases are considered to be, in many instances, distinctly true, even at the present day.

The aphorisms have been called a collection of oracles, and no doubt they did much to enable physicians to recognise the nature and to prognosticate the result in a variety of diseases, and to keep alive some medical information through the dark ages which succeeded the dispersion of the Jews.

He begins by stating that 'life is short, that art is long, opportunity fleeting, experience uncertain, and

judgment difficult.' He says also that a physician must cultivate philosophy if he is to succeed in his work, and he concludes that a physician who is a philosopher is equal to a god.

If we look into the oracular utterances which came from Delphi and other acknowledged fountains of supposed wisdom, we catch glimpses of these truths. Men did things which they were ordered to do by the oracles for the purpose of having themselves or their relations cured of their diseases—things which they would not have done if they had been advised to do them by their local physicians. The order to go and wash seven times in Jordan was, and is, usually too simple an instruction, unless it is accompanied by some mysterious utterances or some cabalistic performances which have an action upon the minds of those who were subjected to the effects. Simplicity was not believed and was not understood, and the most ancient proverbs or edicts with which we are acquainted were those which were made into religious observances. Those edicts which relate to sanitary law, and which were promulgated by Moses, are wonderful evidences of his clear insight into the causes of disease; the method by which infectious complaints were to be eradicated cannot be much improved upon by the arrangements recommended even by the intelligence of the present day, for they consisted of ventilation, of washing, of disinfection, and cremation. By making those performances into articles of faith, he was using a power to obtain his object which was more likely to be effectual than by any other then possible plan.

The travels of the Children of Israel in the wilderness furnish several instances of sanitary operations which have not been always put in their true light. We read that the Israelites could not drink the waters of Marah because they were bitter. Those waters were sweetened by the use of the branch of a tree growing in the neighbourhood. This action, which foreshadowed the custom of tea-drinking, is rightly made into a miracle in these later days. It pointed out a way by which water may be purified from its noxious qualities by infusing certain ingredients into it. It is a consolation to the tea-drinker of the present day that he not only takes for his usual diet 'the cup which cheers and not inebriates,' but he also takes into his internal economy a water which in all probability has been deprived of all noxious ingredients of the organic variety which it might contain when delivered to the housewife. Tea-drinking is a great preservative against cholera and fever. All the classes of disease which is spread by living germs or microbes in potable water, are removed: boiling it and then pouring it upon a material containing tannin is pretty certain to remove all evil from it which can set up infectious disease—for what the boiling does not effect the tannin will, and our tea-drinking friends need not be frightened by the onslaught of any who may happen to be put forward by a certain trading interest, and who at this present day are loudly crying out, 'Great is Diana of the Ephesians.'

Another custom which had its origin in Arabia and Egypt, and which was instituted by Moses as an edict to be religiously observed, was the burning of incense. They offered to God a part of that which they held to be most precious, and at the same time fumigated the wearing apparel of the worshippers, and to some extent the air itself, and by so doing diminished the chances of the evil likely to arise from the crowded assemblies, which

were then held at stated times, for the pure religious worship. Plutarch mentions Egyptians offered incense to the sun; resin in the morning, myrrh at noon, and a compound of frankincense and myrrh at sunset. Moses, probably knowing the beneficial results which followed this ceremony, having observed that illness resulted when the ceremony was not performed, when he resided in Egypt made it a part of Hebrew worship, and thus secured the performance whenever religious ceremonies were undertaken. Its continuance in the Middle Ages, by the Christian churches, was a necessary precaution, and assisted to produce a certain ozone in the atmosphere which diminished the chances of the spread of infection among the assembled worshippers. This was done in a pleasant manner, and covered up a noisome smell by one more agreeable. The old proverb hath it 'that the smell of garlic takes away the smell of dunghills,' and thus the ceremony assisted to promote the ventilation of apartments, by which all kinds of miasma were lessened in amount, and the epidemics of those ages diminished in frequency and in intensity. The great evil was lessened by a simple plan, and a religious ceremony was sure to be performed, but which as a sanitary precaution would have had no chance of observance when infectious diseases were not present. Yet the time to prevent disease is before it is grown up in intensity. The development of the first germ or seed is of the greatest importance, and incensing therefore was a necessary precaution for the priests even more than for that of the people. There is a proverb well known to the people, which especially applies to sanitary work, viz., 'One year's seeding, seven years' weeding.' This proverb is a true expression of the importance of allowing a single case of infectious disease to grow up among the people. Illustrating this by a reference to small ones, I would point out all here the great importance of early intervention, being afforded of the presence of infectious diseases in the homes of the poor, so that incensing performed at the right time, and by the right agencies, a single case attacked with vigour, by incensing other agencies, which ought to be immediately available among the people, may be the means of preventing the spread of a serious epidemic. A single weed rooted up by the gardener at seed time, saves him work of the same kind for seven years to come.

Incensing may, or may not, be carried out in sacred services, but it must be done immediately in all cases of infectious disease by the local authorities, and I urge the people of Dublin, therefore, that it be carried out. By incensing you will understand that I mean disinfecting the wearing apparel by a judicious use of proper disinfectants.

You have an organisation in Dublin capable of good work in this direction. The Sanitary Association, with scarcely 200 members, although it is in a city of 250,000 people, has for the past twelve years been at work in trying to popularise sanitary truths, with a moderate amount of support: let me urge upon you to help it in similar societies. Shakespeare says truly—

The web of our life is of a mingled yarn,
Good and ill together.

(*All's Well that Ends Well*, Act iv.,

No one here present knows how soon he

down by mischief from one of the bye of Dublin which that Society might have pre- if all those able to do it had joined its ranks, en support to its organisation. You may nfidence in its working; with but small t has already done much good. Help it by ; to create a true public opinion upon sani- tters in general, and thereby to save many d increase the welfare of the community. ups the most remarkable of all ancient pro- e those which refer to strong drink. Moses its use when the priests went into the House and he states (when charging the Israelites e left them) that they had not tasted wine g drink for forty years, and he commends r their abstinence; though it is quite clear er parts of the context that he did not re- e use of wine as a sin for those who wished ge in the luxury. He did not prohibit it er, except to certain persons and at certain The Rechabites were commended in the the Prophet Isaiah, more because they had eir father's commandment than simply for stinence. The wise are warned against its ie Book of Proverbs, and its effects are very put before the readers of that wonderful reflections and sage counsels by one who y knew all about its effects.

however, not until the days of Mahomet meet with a general acceptance of absti- om wine and strong drink by great masses le. I have very little doubt myself but homet's wonderful career was much influ- y his temperance maxims. By making ce from wine and strong drink a part of his tenets he was giving a proof of his intel- uerity over those around him, and laying dation for his future greatness. ad observed the helplessness of men when cups, and the weakness of their mental ie day after a debauch. He determined to blow at such mental degradation by making ition an impossible one among his lieutenants otees. In consequence of the dogma of ce he and his followers became the superiors rdes of Arabia, and eventually a terror to e civilised but less temperate nations of the von, or Roman world. Mahomet with his one God—whom he regarded as a Being , benevolent, and just—and having the f total abstinence on his shield, was able to the face of the moral world and do much to from the degradation into which it had e the sixth and seventh centuries, in conse- of the luxury, the vice, and the intemperance alled civilisation. If he had abjured the the sword; if he had stuck to his articles

and not done evil in order that good ome, and had not forced his views upon the y the pouring out of human blood; if he sted upon the sacredness of human life under umstances—Mahomedanism might have e of the greatest blessings the world had sessed, and it would have prepared the way tianity in a most effectual manner. Clean- as a part of the Prophet's creed, and to this s observed in a way by the sons of Islam, unfortunately it is not associated with a be- ffection. The habit of cleanliness is said Christians to be next to godliness, though y forgotten even in Christian schools and

among Christian communities; but we may be cer- tain that no creed, no dogma, either religious or political, which does not inculcate the sacredness of human life can long continue in the future to hold the mastery over the minds of men.

No other country or people except Mahomedan races have taken abstinence as one of their tenets until the days of Father Mathew. If either Celt or Saxon, or both, had done it—if the colonising power which belongs to both had been strengthened by Mahomet's tenet of sobriety—what a different world we should have around us! The bitter cries which go up from the banks of the Thames, the Clyde, and the Liffey, and from a greater part of this beautiful island, as well as from all parts of the world to which the trade of the United Kingdom extends, would have been shorn of much of their bitterness and intensity. Father Mathew's work was defective, and therefore evanescent, for it was mis- understood. He clearly enough put before the people that it was the drink which led men to do wrong, it was the drink which led men to starve their families and ruin their health, and pour out their blood upon the earth; but it was not the de- testation of their crimes which caused men to be abstainers, but because it led men to miss their mark, as was said when a total abstinence lecturer was asking an Irish audience as to the evils which the drink had done. 'It led men (said the lec- turer) to shoot at their landlords,' and, said a voice in the crowd, 'To miss 'em!' It was not the dis- gust for the degradation caused by drink which led to Father Mathew's temporary success; but it was a desire to save money, which was used for other and unsatisfactory purposes, and as a consequence the movement has not been permanent. Is it not time to resuscitate Father Mathew's noble work upon a firmer basis—viz., one connected with the sacred character of human life? and to prevent that reflection (disgraceful to him who wrote it) which appeared the other day in the *London Times*—'That people generally would think it better that an Irishman should be addicted to whisky even in excess than that he should be skilful and successful in taking aim at a landlord from behind a hedge.'

There is another sanitary work intimately con- nected with religious tenet, which I cannot pass by without referring to—viz., that of 'fasting.' Those were clear-headed observant men who instituted a fish dinner on Friday. The daily use of meat has its disadvantages, and sets up evils of a serious kind connected with gluttony, which the fathers of the Roman Catholic Church turned to good account when they made abstinence from meat on Friday a part of their religious duty. Fresh fish contains much of that material which renovates nerve matter, and assists to prevent its decay, whilst an interval of rest from strong meat enables the brain to become clearer for its Sunday work by giving time to the blood to be purified from excess of nitrogenous food. All honour to those men who used their knowledge to such good and such unselfish purposes. If all dogma had such foundations it would have been much better for the interests of the human race. But, at the present day (as well as in former times), it is too often used for selfish purposes, and for personal aggrandisement. Sanitary knowledge, however, is forcing itself upon the attention of all parties in the State; politicians are ready to take hold of it and use its arguments in their favour, if it will secure

them a few votes at a given election ; but as soon as the candidate obtains a seat in the House of Commons, or in any other elected body, the majority of sanitary reformers forget their pledges, and allow the evils which they promised to eradicate to go on eating into the vitals of the people.

Can we not do something to change this plan ? Is it not time for politicians to shake hands over the measures which are called for by sanitarians because they influence the health of the people ? Why should not such measures be taken out of the range of politics, and put before the House and our town councils as non-political measures, to be judged upon their merits ? Why should not Sanitary Bills be backed by the names of men on both sides of the House, although they are Government measures ? Departmental Bills of this kind ought not to be impeded, blocked, or thrown out, simply because they have been introduced by a Liberal or a Conservative Secretary of State, as the case may be. The unpatriotic conduct of political men is much to be deplored, for it appears to those who watch the game from an unpolitical standpoint that place is of more importance than progress, and measures which are good in themselves must be opposed because they are brought in by the Government of the day. Ireland has suffered more for this action than has either of the sister countries, and the effrontery with which both political parties have been bidding in past years for the Irish vote, by pretending to be benevolent, has been most marked in offering to do something for Ireland, when they ought to have insisted upon the work, if it was necessary, being done by Ireland herself. This conduct has assisted to breed up a pauperised class, just as it has always done on the other side of the water, in those towns which have been cursed by a mistaken benevolence, which has so reduced a portion of the population as to lead them to be unable to assist themselves. Benevolence misapplied, as all political benevolence is sure to be, ruins the independence of a people, and tends to destroy that self-respect which can alone raise a nation to her proper place in the universe. Can we hope for much improvement in the health and morals of the people, either here or across the Channel, whilst such a plan is in the ascendant ?

I am not arguing in favour of compulsion in sanitary work, I mean governmental compulsion. I do not believe in the use of force for such purposes by a paternal government ; but I would urge that whilst regarding 'every man's house as his castle,' in which he may do as he likes with himself, he has no right to crowd it up with inmates in excess of its capacity. There are limits in the power of so many cubic feet of air to sustain life in good health. When a man asserts his right to cram his house with too many occupants, the local authority, that is, your representatives on your local council, should be able and willing to set the proverb aside, and say to that man, you may smother yourself if you like, but you shall not smother your wife and family ; you shall not decoy your neighbour in as a lodger, and deprive him of his health, and his country of his value as an operative ! Overcrowding is at work in Dublin as well as elsewhere, and the great mortality which arises from this cause is produced by the desire to get rich at the expense of the life blood of the nation. No one can read the report of our President and his colleague regarding the sewerage and drainage of Dublin without being satisfied with its truth. 'There is more money got by ill means than by good acts ;'

but the heaping together of money by men who crowd their hovels or their acres with more of their fellow creatures than the area can fairly accommodate is one of the most debasing and brutal kinds of money getting, which should be put down by the strong arm of the law, put in force by public opinion. The municipal council chamber should vie with Imperial authority in crushing this canker, which strikes at the vitals of the commonwealth ; and it becomes the duty of the State to see that the houses provided for the poor are not overcrowded, and are not imperfectly ventilated, that they can be kept clean and are well provided with that important necessary of life, pure water, and that waste and impurity can be rapidly removed from among the occupants. By its being the duty of the State, I mean the duty of the local authority armed with power conferred by the Imperial Government. Is Dublin doing her duty in this respect ; are the inhabitants of this great city alive to the fact that the expenditure of money by the local authority will be repaid to them tenfold in the better health of her people ? 'There is that scattereth and yet increaseth, and there is that which withholdeth more than is meet, but it tendeth to poverty.' (Prov. XI., v. 24).

I wish I could have this proverb written in letters of gold in every council chamber in the kingdom ; it ought to be before every man aspiring to be an alderman or councillor in every corporation, and as much in Dublin as anywhere else. With a death-rate of 28 or 29 in the 1,000 it is evident to every sanitary reformer that someone is responsible 'for withholding more than is meet' in this place.

The working men of Dublin are a power ; here they can elect a majority of the representatives in the Council. Do they know what is meant by a death-rate ? The town I reside in used to have a death-rate of 26 in the 1,000, it is now 16. That is, the lives of ten persons out of every 1,000 are preserved to their relatives who would, but for sanitary expenditure by the local authority and by private persons, be numbered with the majority every year. Let us suppose that the death-rate of Dublin were reduced from 28 to 16, it would mean that the funerals in the course of the year would be diminished by more than 3,000, a serious matter for the undertakers, still, a trifle worth preventing. But it would also mean much more than this ; for every death there are twenty cases of sickness, and if there are 3,000 fewer deaths, there would also be 60,000 fewer cases of sickness among the people every year. Let me ask the members of the benefit societies who happen to be present whether they can realise this fact, whether they can understand that for every death prevented there are twenty cases of sickness also prevented. Let us suppose that 20,000 of the working men of Dublin belong to benefit societies. They have to pay in weekly or monthly payments sufficient to provide for a sick fund ; the greater the sickness, the more they have to provide from their earnings to meet it. If sickness is permanently reduced they will be able to permanently reduce their payments on this account. The 20,000 members will at present death-rates average at least ten days illness for each member in every year. If you diminish the death-rate you will also diminish the sick pay (which has to be provided), and reduce it to an average of six days per year. If you bring it down to be equal to that of the town in which I reside, your 20,000 members will be saved from having to provide for 80,000 sick days' pay in each

car. They will also have in their pockets the wages which they will have been able to earn in work, instead of the half-pay which sick-pay provides, and they will not have had to contribute so many levies for the extra funerals which the higher death-rate has levied upon them.

Let me ask the working men now present if the proverb I have quoted is not one specially intended for their benefit, and that for their own sakes, as well as for that of their wives and families, they should take care to send men into the municipal council who will not be afraid of expenditure which is likely to be of the kind 'that scattereth and yet increaseth.'

That they should consider these local questions as of far greater importance than those political questions which but too often lead men to elect representatives because they belong to a particular political party, instead of being wise and thoughtful sanitary reformers. Party politics ought not to enter into the consideration of our local representatives, and any council elected on such lines will not be the best council for sanitary work.

Ask those who wish to represent you if they will take measures to prevent overcrowding among you; if they will take care that every house is provided with a supply of pure water at the lowest possible cost, or at the cost of the owner, and that there are houses which are fit for the poor to live in; if they will take care that waste and refuse be removed from your midst before it has time to set up mischiefs, similar to those which are now making themselves felt in the stinking towns of Southern France and Italy; ask them to insist upon the Liffey being restored to its pristine character, and not leave it any longer to be a *cloaca maxima*, a great sewer, and as such a disgrace to the fairest city in the kingdom. It is curious to my mind to see how carefully some of our public men—local as well as imperial—seem to be wise in their own eyes, and yet fail to see that they are like the foolish virgins of Scripture, though the inference will force itself upon the mind of the thoughtful man that they only represent the public ideas. We are sending all over the world for phosphates and artificial manures, we are paying almost famine prices for meat and milk, whilst the very materials which should be turned into those articles are sent into the sea as food for fishes, which we don't catch, or, if they are caught, are not consumed, or are used for impeding the navigation into the docks and harbours of our great cities, or poisoning the inhabitants of our inland towns, or are destroyed as valueless. This observation applies to Glasgow, to Belfast, and to London as well as to Dublin. The town in which I reside does differently; the sewage is not sent into the sea, but it is returned to the land, as all sewage ought to be; it benefits the nation by growing green crops. Every acre under sewage cultivation can grow five times as much herbage as it did before it was so cultivated. There is five times as much meat and milk raised on that land as formerly used to be the case, and by so much has the tendency to meat famine been reduced.

If all the sewage of London had been treated in a similar way, 60,000 head of cattle might have been raised and fed each year in addition to our usual home stock. This addition would have made us by so much the less dependent upon foreigners for our meat supply, and have made a larger market for the young stock of the sister-country. The inhabitants

of London prefer to throw their refuse into the River Thames, to poison their neighbours lower down the stream, to damage their harbour, and so prepare for the time when the shipping trade of London will become impossible. The question is raised by narrow utilitarians as to whether sewage utilisation will pay. Patentees and company mongers join the cry, and prevent the progress of this great work.

I have so often urged that it is not a question as to the payment for this or that particular year, or this or that particular outlay, as that in the end a national benefit results which will pay ten times over more handsomely than it is possible for the River Thames or the Liffey to do by being transformed into an immense sewer. Sewage irrigation has outlived the outcry made against it that it was a sanitary danger; it has been shown most conclusively that it is perfectly free from such evil. It has been shown that the produce from it can vie with any produce as to its goodness and commercial value, and that wherever there are people to produce sewage, there is a market for that produce. More than 100,000,000 gallons of water are daily abstracted from the collecting grounds of the Upper Thames; they are used in washing the people and flushing away their refuse into the drains of London, and are then, with the collected mass of filth, sent down to Crossness and Barking to poison the lower reaches of the river, and gradually produce a state of things which will make the future sanitary history of that river somewhat similar to that which now belongs to the Pontine Marshes or the Deltas of the great rivers of India, whilst the bed of the Thames above the metropolis is being deprived of its proper water from the deep springs which ought to supply it.

It is now a question of money, but in the end it will be a question of vital importance to London. It is one which has no political significance like a Turkish or an Egyptian loan, and there is no palm oil belonging to its promotion. The 100,000,000 gallons of water fouled by the filth of London ought to be returned to the land from whence the water came, and ought to be again filtered through the Chalk Hills, the Woking and other sand beds, or the barren acres of Surrey, Hants, Berks, and Oxfordshire, by which tens of thousands of cattle might be nourished, and millions of gallons of milk provided for the teeming population of the great metropolis of the Empire, and so render them less liable to the incidence of that meat famine which will come whenever the foreign markets are closed to our merchants and shippers. Those acres are not now worth 5s. per annum. If they were supplied with the sewage of London, they would be agriculturally worth at least 5l. per annum, but an 'Englishman's house is his castle'; his country may want meat and milk, but it must not grow these articles near to his broad acres, though it contains his countrymen's diet, and may be the means of saving them from the chances of starvation in some future time. The ideal damage which such a use is supposed to produce is enough to stop a national benefit, and prevent the carrying out of those works which would transfer the barren ranges of hills to the north-west and south-west of London into fruitful fields, and fill the River Thames in the driest season with a healthy flood of waters. The sanitarian has a duty to perform in addition to the saving of life; he must take care to prevent his work from bringing about a result which will come if an increasing people be not properly fed. He is able to show you that Lord

Palmerston's saying is perfectly true, viz., that 'filth is but matter in the wrong place, and that if it be transferred in a proper form, and in a proper manner, to its proper place, it will provide food for the people.' Yet we allow it to go to waste or we promote measures to render it valueless, and so misuse our noiseless highways in a way which must render them in the early future as noisome as the Tiber became to the inhabitants of ancient Rome.

I would urge upon the inhabitants of this beautiful city that they rest not until the sewage is taken out of the Liffey, and sent to its proper destination, viz., to the land which wants it; that they rest not until the inhabitants in their close quarters have more breathing space among them. That water should be available for every boy or girl, as well as every man and woman wanting it, without stint, and that the pure air from your native hills shall not be fouled with noisome impurities as soon as it reaches the precincts of your city. You will then have paved the way by which health may be secured, and a happy and long life be yours, for 'national health is national wealth.' Recollect, however, that 'cleansing a blot with blotted fingers maketh a greater.' The first principle of sanitary work must be carried out in the individual house. The householder must desire a healthy home, and to have it he must purify the governing body from the presence of those who prefer an unhealthy people.

VENTILATION OF CHURCHES.—Messrs. Robert Boyle & Son, 64 Holborn Viaduct and Glasgow, have recently applied their Patent Self-acting Air Pump Ventilator and System of Ventilation to the following churches:—St. Giles's Church, Soho; Palmerston Road Church, E.; Congregational Church, Burdett Road, E.; New Church, Hornsey Road; Wesleyan Chapel, Gillespie Road, N.; Baptist Chapel, Plymouth; Independent Chapel, Ilfracombe; Congregational Church, Brighton; Wesleyan Chapel, Comb Morten, Devon; Christ Church, Murfield; Mount Zion Chapel, Sheffield; Strood Church, Kent; New Methodist Chapel, Colridge, Burslem; Carrs Lane Chapel, Birmingham; Greystones Parish Church, County Wicklow; St. Paul's Church, Bedford. Messrs. Boyle have also just completed the ventilation of St. Matthias Church, Earls Court, for Mr. Arthur W. Blomfield, architect, for whom they have also recently ventilated the chapel of Emmanuel College, Cambridge; St. John's Church, St. Leonards; and St. Michael's Church, Paddington. Plans have also been furnished for the ventilation of St. Mary Redcliffe, Bristol. Messrs. Boyle have received the following valuable testimonial from Mr. Blomfield, 6 Montague Place, Montague Square:—'I have used the Air Pump Ventilator of Messrs. Robert Boyle & Son with satisfactory results. I believe the system to be a sound and good one, and capable of varied application with success.—(Signed) ARTHUR W. BLOMFIELD.'

THE *Gazette des Architectes* announces that it is proposed to institute in Paris a special 'service d'hygiène municipale,' to unite under the control of one chief all the services concerned in the sanitation of Paris. These include the management of the water supply, of the sewers, the overseeing of 'ordures ménagères,' and of the cleansing of the public streets, the cleansing of brooks and of the street channels, the sanitary treatment of the Seine, the control of all dangerous or insanitary structures, the medical inspection of schools, of lodging-houses, and of the municipal laboratory, &c. This functionary, who is to have the title of *sous-directeur*, will certainly have enough to do. With us he would probably be Minister of Health.

'ISOLATION versus VENTILATION'

By H. PERCY BOULNOIS, M.Inst.C.

ANALOGOUS to the question of the disposal of sewage is that of the danger arising from gas passing along the public sewers; and the object of this paper is to open up a discussion upon the somewhat vexed points as to the best methods at present known for the so-called ventilation of our sewers, as to what methods have been attempted, and whether these attempts have been successful. An endeavour will be shown that the modern practice of opening up centres of the streets is unsatisfactory and dangerous, and that it is a far more important measure to isolate the house from the means of simple and effective traps, than these openings in the sewer, and that if ventilation is perfected the sewer ought to be completely out of smell as well as out of sight, now unfortunately far from being the case.

The present system of ventilation seems to have originated about the year 1830, when grievous complaints were constantly made by the inhabitants of the City of London that great stenches arose from the gulley-pits at the sides of the roads; that being trapped, caused the foul air to pass into the untrapped house-drains into the houses themselves, and the remedy proved more unsatisfactory than the original complaint. The cure that was then suggested itself was the relief of the foul air by making openings in the walls of the sewer, carrying shafts to the centres of the streets, and protecting these shafts with iron grates, a practice which has been steadily copied ever since.

These openings, however, were speedily found to be all that was necessary, for in spite of the foul air still entered the houses through the drains, and the object had not at all been attained. Consequently traps were introduced in order to break the continuity of the house-drain; but now old-fashioned brick pit, with slate tongue, called a Mason's trap, and then the deep trap was introduced, the seal was deepened, and traps were inserted in all the different parts of the system in order to secure isolation of the house. It is only of quite recent date, however, that the real secret of the separation, or isolation of the house, has been effected, and this was done gradually—by the cascade action in the trap was introduced, the important addition was made of leaving the soil-pipe open for ventilation. This was done by cutting off all connections between the soil-pipe and the waste-pipes from sinks, baths, &c., and causing them to empty on to ground by other methods; and then the pneumatic system was devised, by which fresh air is introduced into the house side of the trap, and a current is constantly passing through the house-drain, the help of the deep trap entirely cuts off from the common enemy, the public sewer, and renders it as completely isolated as modern science can effect.

Owing to the varying level of the fluid in the sewer, some escape must be provided for the gas contained in it, otherwise one or more of the drain traps would be unsealed by the air as

² Read at the Congress of the Sanitary Institute of Great Britain at Dublin, on Oct. 2, 1884.

use, and this can easily be effected by carrying a shaft of about 6 inches in diameter from the crown of the sewer near its highest level to some convenient and safe height against an adjoining building. One such shaft would be sufficient for nearly any ordinary street sewer to relieve the pressure upon the traps until long after the connection of the house-drain with the sewer was below the level of the sewage, and this would meet the requirements of the most violent rainstorm, and prevent the unsealing of the deep sealed traps. Should, however, a trap become unsealed, the open character of the house-drain and the traps of the water-closets, which should be of some simple wash-out pattern, would quite prevent the chance of entry of any of the foul sewer air into the house, and thus the sewer ventilation, as it is called, becomes perfectly unnecessary.

Before proceeding further to discuss the question, it will be interesting to observe the following chronological list of different methods which have from time to time been suggested or actually attempted, not only for the purpose of ventilating sewers, but also for processes of destruction, retention, or harmless conversion of the different gases contained in the sewers.

The list is as follows:—

1840. Open shafts, as already described, were first introduced.

1848 to 1853. Captain Shrapnel made a suggestion that high cast-iron cylinders should be constructed over the sewers in which furnaces should be placed to consume the gases.

Messrs. Warr and Armstrong proposed to build domes over the sewers from which pipes should conduct the foul air to a central gas-holder, whence after purification it should be distributed for street lighting. Another proposal, about the same date, was that sewers should be hermetically closed except at one point, where an air-pump would extract the foul air and drive it through fire or a solution of chloride of lime. A suggestion was also made that coke factories should be established near the lines of sewers, and the gases therefrom passed through the ovens.

1854. Sir Joseph Bazalgette in London successfully ventilated a sewer on the south side of the Thames by carrying a pipe from the crown of the sewer into the tall chimneys of two factories. In another case, however, in Friar Street, where this was again attempted, an explosion occurred which led to the abandonment of experiments in this direction for a time. Mr. Gurney in the same year tried the effect of steam jets introduced into a sewer, but without any good result.

1855. Mr. Mumby proposed that the gas lamp-posts or columns at the sides of the streets should be used as sewer ventilators; but as these are only lighted at night Mr. Robins suggested that the posts should have trays filled with disinfectants placed in them, over which the sewer air should pass.

1856. Shafts were erected at the ends of streets connected with the dead ends of sewers, and carried up the gable ends of houses.

Furnaces in connection with these shafts were also recommended.

1858. Mr. John Chisholm tried the effect of electrical or galvanic action upon the air in sewers, but without beneficial result.

1866. Trays filled with charcoal were introduced by Sir Joseph Bazalgette and others into the ventilating shafts.

1870. Sir Joseph Bazalgette successfully neutralised the foul emanations from a sewer by the introduction of trays filled with sulphurous acids.

1872. Screens or flaps were placed in sewers to regulate the currents of air in them. Messrs. Johnson and Hill proposed that ventilation should be effected by connecting all the house-drains with the chimney-flues. Mr. Miller suggested that the smoke from chimneys should be drawn into the sewers for the purpose of purifying the bad air in them, and at the same time settle the London fog question satisfactorily.

1873. General Scott introduced lime into a main sewer, with the result, to use his own words, that 'the main sewer was perfectly freed from stinking sewer gases.'

Dr. Keates devised an apparatus for subjecting the foul air to the action of chlorine gas.

1875. Mr. Parker, the surveyor of Poplar, England, patented a method by which air was to be forced into the sewer by the action of the wind impinging upon a cowl.

Sir Joseph Bazalgette erected a ventilating chimney, 60 feet in height, with a furnace burning coke, when, to use his words, 'It was found that about 1 per cent. of the sulphur was given off by the coke, and acted as an efficient disinfectant.'

Mr. E. Rumbold originated a method for passing the foul air through a spray of water introduced on all sides of the ventilating shaft.

In the same year, being struck by the absence of smell in an old sewer, in which quantities of stagnant sewage were giving off gases of decomposition, I came to the conclusion that this absence of smell arose from defects in the crown of the sewer, which allowed the foul air to be absorbed in the earth which covered the sewer. The outcome of this observation was the invention by me of what I have designated 'The Sewer-gas Annihilator,' the principle of which is based upon the well-known fact that earth has a powerful action in absorbing and deodorising any noxious gases or emanations arising from matters undergoing decomposition.

In 1882 Mr. Read, the surveyor of Gloucester, suggested that all house-drains should be used as up-cast shafts to ventilate the main sewers, for he argued that as the sewer was used for the benefit of owners of house property, so should they contribute to the ventilation.

Mr. Harrington, the Mayor of Ryde, Isle of Wight, proposed in the same year a system by which air should be forced into the sewers by shafts furnished with cowls, his system being somewhat similar to that proposed by Mr. Parker in 1875, and already described. (See SANITARY RECORD for Nov. 15, 1883, p. 250.)

1883. Mr. Rowan suggested the sub-division of the sewers into sections, so as to ensure their thorough ventilation, 'each exhaustor drawing from the inlets on either side of it, and the inlets consequently delivering air to the sewer in both directions.' The abstractor to be of special construction, and to perform a double function—abstract the sewer air, and burn and destroy any organic matters or germs contained in it, the sewer air being made to pass through a number of small tubes heated by a gas jet. Mr. Rowan claims that not only is heat thus made to destroy the danger in sewers, but that fresh air is also admitted into them—the two most important points in connection with this question.

With regard to the systems of ventilation at present in vogue, that of open gratings in the centre of the streets is the most general. By a return recently published, it is found that out of sixty-six important towns in England, fifty-five of them adopt this system, and it certainly has the merit of being economical and simple, both in construction and maintenance, and it relieves the sewer from any air-pressure when its contents are running at a higher level than usual.

The system, however, does not comply with sect. 19 of the Public Health Act, 1875, which states that sewers shall be ventilated 'so as not to be a nuisance or injurious to health.' The street gratings are an undoubted nuisance, as they unload their foul air under the level of our noses, and it is possible they may be injurious to health: for although, on being liberated, the dangerous qualities of the sewer air are said to be diluted, dispersed, and rendered harmless and innocuous, it has never been satisfactorily proved that the atmosphere kills the disease germ, should he be there lurking, or, if it does kill him, how long is taken in the process? certainly not the short time elapsing on the journey between the grating and the footpath. There is no doubt that excessive dilution lessens the risk of contagion, but the system does not seem successful unless immunity from nuisance and disease can be assured.

It is said that where the sewers are in a good condition no nuisance arises from the ventilators; if this is so, the question may fairly be asked if they are of any use in such cases, and whether the perfect sewer is not just as perfect without them. Advocates of the system state that it is impossible to have too many openings, and thus open sewers would, no doubt, be the most desirable. The town of Leeds is frequently held up as a model in respect of the ventilation of its sewers; let us compare its death-rate with that of the town of Bristol, where not a single sewer ventilator exists:—

Leeds has a population of 15·2 per acre; Bristol has a population of 46·5 per acre; Leeds had a death-rate for 1883 of 23·30; Bristol had a death-rate for 1883 of 17·80. Of this death-rate those arising from the principal zymotic diseases were, as regards Leeds, 4·0 per 1,000, as regards Bristol 1·1 per 1,000.

The Commissioners of Sewers for the City of London have for a long time felt that the open gratings were not all that could be wished, and have consequently, quite recently, passed a resolution to enable their officers to treat with builders and owners of property for the purpose of erecting shafts, either in the walls of, or against new and existing buildings.

Open shafts carried up to safe heights certainly have many advantages over the foul smelling gratings in the centres of the streets; and the fashionable watering-place, Scarborough, has, I believe, the whole of its sewers ventilated in this manner; there are, however, some objections to this system, which may be summarised as follows:—

The want of fresh-air inlets, the expense, and the difficulty in obtaining permission to erect the shafts just at the points where they are required, and of course, in new streets that are being sewered, and other localities, there are no houses against which they can be fixed.

The fresh air inlets, as by Mr. Parker's and Mr. Harrington's systems, are an improvement, but they involve that great bugbear to the ratepayer, extra

cost; and there would no doubt be some objection raised to obstructions of the kind being placed against the sides of the streets; otherwise systems have much to recommend them.

The use of the rain-water pipes for sewer ventilation has often been justly condemned; they to act as outlets during rain, but, on the contrary, carry more air into the sewer; and, from their position and possibly bad jointing, are said to be dangerous. The town of Carlisle, however, ventilates its sewers in this manner, there being upwards of 2,150 rain-water pipes in direct communication with the sewers.

Charcoal trays are too well known to require comment.

Large hollow lamp-columns have many recommendations, but they cannot be extensively used unless the gas is constantly kept burning, though of little use.

Pipes carried from the sewer into neighbouring chimney shafts or under furnace fire bars is a system that is gradually extending and has much to recommend it; it is well known that the most powerful destroyer of all forms of germinal life or matter at all stages of their development is heat, and it is probable that in this direction scientific perfection of sewers will be eventually attempted. In Leicester there are upwards of thirty chimney connections which answer satisfactorily.

The early dangers encountered by explosion in connection with this system seem to have been entirely accidental, and probably arose from the admittance of coal gas into the sewers from domestic mains, and no recurrence seems to have taken place for many years.

With regard to special lofty shafts fitted with furnaces, these seem to be effectual under certain conditions, as, for instance, upon main intercepting or outfall sewers where there are few openings. In the case of Brighton, where a large shaft of this description has been in successful operation for many years; but Sir Joseph Bazalgette proved some years ago, and subsequent experiments have confirmed his opinion, that the effect of such shafts upon the general system of sewers would be ineffectual, as the tendency of the exhaust produced by such a furnace is only to draw in sufficient fresh air from the nearest opening.

In conclusion, I wish to lay the following questions before you, in order that they may be discussed.

Is the present system of open sewer ventilation the centres of the streets satisfactory? Does it comply with the requirements of the Public Health Act, 1875?

Do any of the systems which have been enumerated fulfil these conditions?

If the drains of all buildings are properly and efficiently trapped, ventilated, and the buildings isolated from the sewer, is any ventilation beyond a few relief pressure shafts necessary?

Should not this isolation of the house be made legally compulsory?

AMONGST the most recent applications of the Waterspray system of ventilating, heating, and lighting are the Walker Memorial Schools, Leicester, Mr. Consulting Rooms, Harley Street, the New Mission, Duntshill, Wandsworth, the New Baptist Chapel, St. John's Church, Waterloo Bridge Road, Nova Scotia Mills, Blackburn; and St. Mary's, Grassencia, Liverpool.

COLLECTION AND DISPOSAL OF HOUSE REFUSE.*

By W. EASSIE, C.E.

It has not been able to find any statistics giving like the exact analysis of the various materials which go to make up ordinary house refuse, thrown into the dustbin; but whilst Paris is distinguished in the ordinary way by ragpickers, the present municipal cart system was in Paris possessed about 500 rag merchants, employed each some half-dozen rag-pickers, so that it was to collect and sort the house refuse outside the houses. Out of every 136 lbs. of refuse collected in Paris, the following gives the value of what can be sold:—Paper, 40 lbs.; rags, 10 lbs.; and wool, 18 lbs.; bones, 28 lbs.; glass, 10 lbs.; waste cloth, dressmakers' scraps, thread, &c., 10 lbs.; iron, brass, and lead, meat tins, and capsules, 13 lbs.; old shoes, leather, &c., 6 lbs.; india-rubber, and broken toys, 4 lbs. The above will not give us any fair estimate of the weight of the refuse, because, although the above represents the weight of the assorted articles taken out of the dust, and does not include household refuse of our country, where coal is so abundantly used, it must be remembered that the increment of refuse would be very largely increased. In London there would be a much heavier item for the refuse, for old blacking-pots, ink-bottles, &c. In the analysis of the Parisian refuse mentioned articles which were of value to the household, and there must of course be a great deal of waste thrown away there; but, taking into consideration the inhabitants of the two cities, Paris and London, there could be no question that in the case of London, and earthenware, the quantity yielded would preponderate. One thing I dare not say about, and it is that London would beat the rest of continental Europe in a show of empty space and medicine bottles. Some time ago Dr. Roth, of Dresden, the eminent State Physician, put himself under my care, that I might see, among other things, how we managed the refuse of our house and street refuse. I took him to the dust-addington, which is the only completed system I know of, and we were most amused to see the vast number of full medicine bottles which had never been emptied, as compared with the empty bottles which had been thrown into the

most complete treatise dealing with the collection and removal of refuse from houses, as upon every local authority by the Public Health Act, 1875, is that of Mr. Percy Boulnois, which will be found under the head of 'Refuse', in his work published in 1883, entitled 'Municipal and Sanitary Engineers' Handbook'. He enters fully into the law of dust removal, and rather to make a few remarks concerning the practice of dust removal as it is carried on in London. Dust is either collected by scavenging carts,

the bells attached to which in some towns inform the householder that the dustman is passing, and that his portable receptacle of dust and other refuse, which he has previously placed in a handy spot, will be carted away on pointing it out. Or if dustbins are the rule, the letter D placed in the window will indicate to him that the bin is full and must be emptied. It is not often that the dustman calls without invitation, and more often he requires the solace of a small honorarium, especially if there is any garden refuse, wall plaster, old paper-hangings, greenhouse clinkers, or extraneous matter of that kind, which according to most authorities the local board are not expected to remove. Only ashes, peelings, kitchen vegetable leaves, and inside house refuse is bargained for.

All sanitarians, medical or engineering, are of opinion that something better than our present system of dust-bin storage might be devised. Not that the dust-bin is outrageously evil in its conception, but rather that it is abominably treated. It should not contain vegetable and animal matter commingled, rendering the neighbourhood, during the upheaving and emptying of the fermenting matter, noisome with dangerous gases, and not only that, but causing the dust-cart to give off these foul gases during their progress through the streets.

Undoubtedly, the dust-bin could be made portable, and the contents kept automatically disinfected every time the lid was raised, but the chief amelioration would result from a constant burning of the vegetable refuse in the kitchen fire. This, however, would require almost to be made incumbent upon the householder by some by-law, which is hardly likely to be enacted. One word more about these fixed dust-bins and I have done with them. They are seldom water-tight, and mostly placed against the wall of the house, and allow the liquids to drain under the floors and cause a rising dampness in the wall, or the porous walls permit of the foul air being sucked through the walls into the warm rooms.

In London they are mostly constructed underneath the area steps, and their exhalations breathed by servants, tradesmen, and passers by; but frequently it will be found that one of the area vaults has been appropriated, and it needs no argument to show how such large receptacles must affect the sweetness of the basement. I have more than fifty times also found the dust-bin inside a vault which is enclosed in the house, and thus virtually poisoning its atmosphere. Very often, too, just above the dust-bin will be found a cistern, with a badly-fitting cover, and supplying some of the sinks in the basement.

The contents of all dust-bins, at least in London, resolve themselves into four products:—1. The 'ash,' or that compound of fine ash, boot brushings, house dust, &c., which is for the most part moulded into bricks. 2. The ashes or cinders and fine coal which will not pass through the sieve with the foregoing, and which is called 'breeze' and used as fuel where-with to bake the bricks. 3. 'Hard core,' such as broken pottery and other hard refuse which is not worth selling, and is chiefly used for road-making. And lastly, 'soft core,' which means all kinds of animal and vegetable refuse, of course the most difficult material to deal with, necessitating, as in the case of Lambeth heaps, sprinkling with carbolic acid powder before it is barged away for agricultural purposes.

*the Congress of the Sanitary Institute of Great Britain, Oct. 2, 1884.

By far the greater number of the metropolitan vestries, viz.:

The Strand	Poplar
Westminster	Hampstead
St. Giles	St. Pancras
Holborn	St. Saviour's, Southwark
Rotherhithe	Lambeth
Shoreditch	Camberwell
Hackney	Wandsworth
Bethnal Green	St. Marylebone
Whitechapel	Chelsea
St. George in the East	Limehouse

contract with different parties to call round at every street in the district from twice a week to once a fortnight, in most cases, they paying the contractor to cart the dust away. The contractor has in the majority of cases, a wharf on the river or canal, as the case may be, where he either sifts and sorts the refuse and disposes of it piecemeal—the 'ash' and 'breeze' to brickmakers, the 'hard core' to contractors for road foundations, and the 'soft core' to market gardeners and farmers for manure, or he shoots the refuse direct into barges, without sifting, and disposes of it as it is to brickmakers. If he finds no ready market for the dust, &c., he either lets it accumulate or takes it down the Thames, presumably beyond Lee Reach, and shoots it into the water.

In the case of some of the outlying districts, such as Hampstead, the contractors simply cart the refuse and dust in bulk to brickfields in the neighbourhood. Many of the vestries contracting as above are thinking of adopting better methods of disposal and working the system themselves, thus saving expense. The Poplar Vestry have just instituted pails in place of dust-bins, and are negotiating for a piece of land, where they propose erecting a furnace and trying burning the greater part of the refuse.

The system adopted by St. Olave's, Hammer-smith, St. George the Martyr, and Bermondsey is somewhat similar to the above; they have a wharf in their respective districts, where they shoot the dust, sift and sort it, and then contract with a man to take it away.

Islington, Plumstead, Mile End, Woolwich, Lewisham, Clerkenwell, Greenwich, Kensington, St. Mary's (Newington), Paddington, St. Luke's (City Road), and the City Commissioners dispose of all refuse themselves. Of these, Clerkenwell, St. Luke's (Paddington), and Plumstead have a wharf where they sort, and whence they barge away to sell for brick-making, road-making, and manure.

Islington, Mile End, and St. Mary's (Newington) have a dépôt, where they screen into trucks and send off to the country by rail.

Lewisham, Greenwich, and Kensington shoot at various places, without sorting, at any place in the district; in fact, where they can find a market, the places being mostly brickfields.

Woolwich shoots at Charlton, where there is a place wants filling up.

The City Commissioners burn their refuse. Of the above, special mention should be made of St. Mary's (Newington), Paddington, and the City Commissioners.

St. Mary's (Newington) have a large dépôt in their district of Walworth, on the London, Chatham and Dover Railway, and one in the country at Longfield. Their carts call round at each street once a week and take all dust, refuse, and slops to their dépôt in Walworth. Here the dust and refuse are sifted and

sorted in the way common among the contractors by women. The ashes and breeze are sold to brick-makers, the hard core for road foundations, and the soft core and slops (after being treated as explained hereafter) for manure.

The manure or 'mixture,' as they term it, is made in the following way:—A large bed is made about eight inches deep, of old straw, bought by the vestry from the various stables in the district. On this foundation the soft core, consisting of paper, rags, peel, &c., is spread, then another layer of old straw, which is heaped up at the edges so as to form a basin or tank about four feet deep. In this basin the slops obtained in wet weather are emptied, and dry dust is sprinkled on the top of all. The bed thus formed is then allowed to stand for a week or so, at the end of which time all the superfluous water has drained away through the straw, and the 'soft core' has fermented and rotted and become thoroughly decomposed. The bed is then mixed up and sent away in trucks to the country, where there is a very ready sale for it among the farmers for manure. As many as thirty trucks a day are sent away from here sometimes. They have six of these beds, which they work alternately, and there is very little perceptible odour arising from them.

The country dépôt at Longfield is used for storing the ashes, &c., when there is not a ready market for them. The system appears to work very well.

The Paddington system is chiefly remarkable for their method of sifting and sorting by machinery, thus to a great extent obviating the necessity of employing the manual labour of women. The dust, &c., brought in by their carts is shot into a large screen, which separates the larger materials such as flower pots, bottles, and culinary utensils. The smaller material is carried up by buckets fixed on an endless chain, and is emptied into two sieves placed at an angle to each other like the roof of a shed. The paper, bones, &c., collecting on these is raked off by women and sorted, and the dust and ashes falling through is brought up by another system of buckets on an endless chain, and conveyed along a wooden trough into the barge, where it is taken away and sold to brickmakers. The soft core sorted out is sold as manure or burned, and the hard core is used for road foundations as usual, the flower pots, &c., being taken out, of course, and sold separately. The slops are emptied into a large tank built of wooden planks, the planks being placed some two or three inches apart, and the crevices thus formed filled with straw. Through this straw the water drains, and runs away into the sewers. The resulting dry mud is barged away and makes a good mould.

The yard is kept in very good order and is quite extensive, all the vestry carts being made here, and the horses being stabled and shod here.

The City Commissioners of Sewers burn their refuse, and the system is said to give every expected satisfaction. The other vestries who make use of a furnace for burning some of their soft core—the Newington and St. Olave's—are of opinion that the refuse burns very slowly and is very troublesome.

The system of destruction of all kinds of house refuse by burning it in suitable furnaces was reported upon by Dr. W. Sedgwick Saunders in 1851, and it may be taken as forming the most complete essay upon the subject. In this process—which has been largely adopted in Leeds, Bradford, Warring-

Manchester, &c., &c., and in continental countries—an apparatus which is termed a 'destructor' destroys by fire everything combustible in household refuse; and the second apparatus, which is called the 'carboniser,' deals with the vegetable matter and converts it into charcoal. At Leeds large masses of refuse, house dust, market and saved street sweepings, midden night-soil, are delivered on the top of the 'destructor,' and as the material perishes from below it sinks down the surface holes; and at the front, pots, pans, glass, crockery, clinkers, and all coarser materials are extracted. The large quantities of iron utensils fall to the front, and are raked out and allowed to cool, and afterwards sold. When the clinkers, molten metal, and glass (all of which are fused together) has been drawn from the 'destructor,' the clinkers which result from the process of burning the refuse are in some places ground into powder, and when mixed with lime and water it forms a cement which is much sought after. Hard bricks are also made from the same material.

I have nowhere in this paper referred or intended any reference to the treatment of condemned meat and the best method of dealing with that, but have confined myself simply to the disposal of the dust from ordinary dust-bins. I may mention, however, incidentally that there can be no doubt that 'the carcass-crusher, or devil,' at work near Warrington, &c., which breaks up the body, and which is afterwards treated by the rotary fat rendering machine of Mr. Firman, is the completest and most satisfactory method of dealing with that.

Mr. Healey, of Brig House, near York, has lately brought out an improved furnace for converting town and other refuse into clinkers, which appears to be very simple. It would have the apparent advantage over some other methods, that very bulky articles could be destroyed in it, such as bedding, mattresses, and the like.

I think most people will agree in thinking that any system of taking the refuse of towns or cities by barges out to the sea and emptying them there, must be a very poor notion of how far more satisfactorily and economically this material can be disposed of by separation, appropriation, or destruction. At New York, and I believe in Liverpool, a great deal of refuse has been got rid of by sea immersion, but would appear that it was simply for want of space and convenience to utilise it that this crude system of disposal was resorted to.

After a due consideration of the foregoing statements, I think it will be taken for granted that the burning of the refuse is the most satisfactory system extant. There seems to be a very general feeling in favour of this mode of disposal, provided it can be effected easily, and numbers of the vestries are watching with interest the results obtained by the City Commissioners and the system adopted by St. Mary's (Newington).

MESSRS. ARCHIBALD SMITH & STEVENS, of 48 Leicester square, and Queen's Road, Battersea, have been awarded silver medal at the London International Exhibition, Crystal Palace, 1884, for their exhibit of Stevens & Major's Patent Silent-closing Door Spring.

THE Gateshead School Board have decided to introduce into some of the Board schools the system of providing penny dinners for the children. The plan has already been successfully adopted in the town by the vicar, the Rev. W. Moore Ede, manager of one of the schools.

SEWAGE DISPOSAL.*

By Professor HENRY ROBINSON, M.Inst.C.E.,
F.G.S., F.M.S.

THE outcome of several public inquiries which have taken place during the last year or two, and of much valuable data derivable from other sources, establish, we think, a well-marked advance with reference to sewage disposal; and it may be of use, as well as of interest, if we lay before this Congress the conclusions which, we conceive, are deducible therefrom. We propose to deal with the subject under the following heads: 1. Sewage disposal on land. 2. Sewage disposal by chemical treatment. 3. Sewage disposal by discharge into a tidal river, or into the sea, without treatment.

I. SEWAGE DISPOSAL ON LAND.

The object of dealing with sewage on land may be taken as twofold, namely, to purify it (which is the sanitary object), and to utilise its manurial products (which is the agricultural object). Where want of skill, or where prejudice has existed, these two have not been properly separated, and the results have been in many cases unfavourable to sewage disposal on land from either of the before-mentioned points of view.

It has been regarded as an axiom that clay land cannot be employed to clarify sewage. This is true when it is proposed to pour the sewage on it as if the land were porous. Very recent experience, however, has led to clay land being converted from an impervious to a pervious condition, by which it has been successfully utilised. This is effected by digging out the clay to a depth of about 6 feet, burning it into ballast and replacing it in layers, interposed with an occasional layer of open alluvial soil, the whole area being well drained with a free outlet for the effluent. We have successfully carried this plan out, and with this result, that whereas it was not possible previously to clarify the sewage of 100 people to an acre of clay land, the prepared filtration area has been able to continuously clarify the sewage of about 1,500 people to the acre. The cost of converting clay land into this form of filter may be taken as varying from 750*l.* per acre to 1,000*l.* per acre according to local circumstances. One area which we have just completed has cost 1,000*l.* per acre. Before sewage is passed on to these filters (or on to land) it should be strained so as to remove the larger particles. The best arrangement for this purpose is to pass the sewage upwards through a straining medium (not downwards), and to run the solids from the bottom of the straining tank on to a low-lying piece of land for digging in as they are run out.

Where such a filtration area is made to form part of a sewage farm it acts as a safety-valve, and enables the land and crops to have a rest when they do not require further irrigation; at the same time the process of purification is not interrupted.

If open porous land is available for sewage purification, and if it can be drained 6 feet deep to a good free subsoil, so that the effluent can get readily away, we find that the sewage of from 600 or 700 people can be dealt with on each acre per annum with both good agricultural and sanitary results.

In my Address as President of the Engineering

* Read at the Congress of the Sanitary Institute of Great Britain, at Dublin, Oct. 2 1884.

and Architectural Section of the Congress of this Institute at Newcastle-upon-Tyne, in 1882, I directed attention to the important investigation which had been conducted by Mr. R. Warrington, of Rothamsted, the result of which was to show the action which goes on in the soil when sewage is passed through it. Further information, which the same observer has published since that date, is of equal value, and deserves to be read by all who have to advise in regard to sewage disposal on land. The process of 'nitrification' (as it is termed), which he has so fully investigated, consists in the conversion into nitrates (which serves to nourish plant life) of the organic matter in sewage. This takes place by the action of a living ferment of the bacteria family, which is created by and feeds on the impurities in sewage, and these organisms both consume the impurities and convert them into nitrates.

The action of living agents thus brings about the oxidation of the organic matter in sewage, just as worms, larvæ, fungi, and insects, feed on the vegetable matter in the soil, increasing the amount of nitrogenous material in it.

Experience during the past year or two has proved the feasibility of preserving green crops in a succulent state by compressing them in silos, so that they can be utilised for cattle fodder in the winter. This system deserves notice in connection with sewage farming, as I am of opinion that it will prove a valuable means of getting over the well-known practical difficulty which is experienced of finding a market for the large amount of green crop which is produced by sewage irrigation.

2.—SEWAGE DISPOSAL BY CHEMICAL TREATMENT.

In the last edition of my book on 'Sewage Disposal,' in speaking of precipitation, I said that 'the purification of sewage by chemicals has been the subject of misapprehension, owing to the extravagant advantages which have been claimed for the system by its advocates.' This is even more true now than it was two years ago, inasmuch as in the recent scheme for dealing with the sewage of the Thames Valley chemical treatment *per se* was relied on to produce from the sewage of a future population of 350,000 an effluent at all times fit to be discharged at one point into the River Thames above London, but the Parliamentary Committee rejected it. One part of the report of this Committee deserves attention, when speaking of sewage treatment by chemicals. It is as follows:—'Your Committee believe that in these cases the process of filtering the chemically purified effluent through earth ought, if possible, to be adopted, which was not provided for in the scheme under their consideration.' This opinion is exactly in accordance with our experience, and is that which I have held throughout. It is at the root of the whole matter, because efforts are made by those interested in chemical processes to attain as high a standard of purity as possible with the attendant heavy expense of chemicals. Experience shows that it is impossible at all times and seasons to be sure of a constant and uniformly high standard of purity, and that chemical works should be supplemented by a filtration area, however small. The addition of this, however, enables a lower standard of effluent from the precipitation tanks to be admissible, and this can be attained with very simple and inexpensive chemicals.

In the course of our practice I have had to ad-

vise as to the majority of the processes, and to design the works for their being carried into operation. I have found that the cost of such works complete varies from '091 to '166 of a £ per head of the population, and that the average cost of the works at several towns which we have been connected with is '123 of a £ per head. This figure may be conveniently followed by that of the cost of treatment, which I find varies from '035 to '110 of a £ per head per annum, and an average of several places gives '06 of a £ per head per annum. The above figures apply only to places where the very highest standard was sought to be attained, but my more recent experience leads me to modify the arrangement of the works and the cost of treatment, so as to rely on filtration of the effluent as an important factor. I estimate that under these conditions the cost of the works complete would be about '075 of a £ per head, and the cost of treatment '04 of a £ per head per annum.

The disposal of the sludge has always been a difficulty in these works, but this is now overcome in two ways: either by digging it into the ground, as is done at Birmingham now, or by pressing it into cakes in filter presses. It is found at Birmingham that one ton of sludge with 90 per cent. of moisture is produced from 1,000 people. There the lime process is used. I have found that about one ton to 2,000 people is produced where a salt of alumina or iron is used with the lime. At Birmingham the sludge is dug into the land adjoining the works, and it is found that one square yard of land will take one ton of sludge with 90 per cent. of moisture once in three years, which results in three yards of land being required to be provided for each ton of sludge. This system of digging in sludge is successfully carried out as regards freedom from nuisance. Where land is not available to dig in the sludge it is necessary to make it portable for removal and disposal away from where it is produced. This is best effected by filter presses. Appliances are made for this purpose, by which the sludge is pressed to a consistency of about 50 per cent. of moisture. The cost of effecting this is about '007 of a £ per head per annum. It is found in practice that where the sludge is produced by straining the solids from sewage before passing it on to land for purification, it requires a little lime to enable the press to work well. About two barrow-loads of lime for each ton of pressed sludge suffices.

It has been thought that the cost of precipitation would be covered, and even a profit gained, by the sale of the sludge. This hope, however, is not nearer realisation now than it was in the time, now gone past, when chemical processes were relied on to turn sewage from a profitless into a profitable commodity. There is, consequently, less justification now than there was at that time for adopting a precipitation system for sewage disposal. It is entirely a question of carefully considering the engineering and financial points involved, regardless of the sanguine representations of interested or enthusiastic advocates of any particular system.

As the estimated manurial value of the sludge which is precipitated from sewage by the addition of chemicals does not seem to be capable of realisation, I think that probably the reason may be found in the fact that the chemicals arrest that process of decomposition which is essential to the conversion of the organic matters into nitrates for vegetation to utilise. This explanation will be under-

stood in the light of what we have already described in regard to 'nitrification.' If this view is correct, it would follow that the more completely and permanently the sludge is deodorised by the chemicals the less capable is it of passing through the necessary stages of decomposition by which its manurial value can be realised.

As mistakes are constantly being made in regard to the weights of sludge with varying degrees of moisture, the following table may be useful :

100 tons of sludge with 90 % of moisture = 50 tons with 80 %			
100	"	33'3	" 70 "
100	"	25	" 60 "
100	"	21	" 50 "
100	"	16'6	" 40 "
100	"	14'3	" 30 "
100	"	12'5	" 20 "
100	"	11'76	" 15 "

3.—SEWAGE DISPOSAL BY DISCHARGE INTO RIVER OR SEA.

I will next deal with the conditions which should be fulfilled where it is sought to utilise a river or the sea into which to cast the sewage of a town. If it can be ascertained beyond question that at the proposed point of discharge the currents at all times will carry the sewage right away, and will not at the same time produce mischief at a distance (which is often omitted from the consideration), then that arrangement may be accepted as a good one. This, however, seldom occurs.

A river has been looked upon by manufacturers and local authorities as the natural carrier of their refuse from their district. This view has been persevered in, in spite of the River Pollution Prevention Act of 1876, which is practically a dead letter. The public, however, who use a river either for pleasure purposes or for obtaining their water supply, have of late years grown more and more united in their efforts to stop this abuse, and there is no doubt that these efforts will eventually succeed. In a paper which I read last year at the Congress at Glasgow, I pointed out the steps that were necessary to be taken to render this Act operative, and I refer my readers to that paper if they wish to follow the matter further.

The effect of discharging sewage matter into a river has been the subject of much controversy amongst chemists. Some allege most positively that the injurious properties in the sewage are indestructible. This has led to alarmists demanding that under no circumstances ought sewage to pass untreated into a river. I have given considerable attention to this vexed question, as it requires to be grasped by any engineer who has to advise on the selection of sewer outfalls, and it appears to me that the balance of evidence is against the alarmists. Every river has a certain power of oxidising impurities, in proportion to the extent of oxidation of the river itself. Besides this, there are the powerful purifying influences exercised by the plants and animalculæ which exist in rivers.

It has been ascertained that entomostraca consume dead animal matter, and where this is wanting they do not live, but where it is in abundance they thrive. It follows, then, that these minute animals exercise an important function in absorbing sewage impurities. They multiply prodigiously in these impurities, and are both created by them and fed upon them, converting foul and dangerous matters into harmless ones, in a similar way to that which we have referred to as nitrification when speaking of the action of bacteria in the soil. Considering that these

organisms arise from and are fed on concentrated filth, it is obvious that they cannot live when the conditions favourable to their existence disappear. This would be the case when the sewage is discharged into a large volume of water with a different temperature to that which suits them, and with powerful oxidising influences at work. These conditions, added to the difficulty they must experience to find their natural food—namely, concentrated sewage—where the sewage matter becomes so greatly diluted, accounts for the fact that in a short run of a good river sewage impurities largely disappear. The action of weeds and plants also aids purification to a very large extent. Minute plants, such as confervoid algæ and the like, also assist in oxygenating the river, as when exposed to light they decompose carbonic acid, and liberate oxygen.

The practical question which has to be answered in every case where sewage is proposed to be discharged into a river requires to be approached from two points. The first is whether a nuisance will be caused at the spot to which objection would be taken. If this is likely to be the case then the fact that the sewage will get purified in a short run of the river does not meet the objection. The second point requires a careful consideration of the condition of the river, both from an engineering as well as from a chemical and biological point of view. Decisions on these matters have too often been arrived at in a rough and ready way. They require skilful treatment, as the interests—both commercial and hygienic—which are affected are too great to permit of them being dealt with by any who are not well informed and careful.

The general conclusions which I deduce from my observations are as follows :

1. That chemical precipitation is not so necessary now as it was considered to be a few years ago in cases where land for irrigation is not procurable.
2. That the efforts to profitably remove the manurial elements from sewage by chemicals not having been successful, the system should be adopted *per se* only where a filtration area cannot be obtained.
3. That the success which has attended the construction of filtration areas where the land is clayey, and the successful results which have been obtained from a combined straining of sewage and of subsequent filtration through small areas of artificial filters, point to the adoption of one or other of these systems in many cases where chemical treatment would previously have been advised.
4. That the injurious effects of passing untreated sewage into a river depend upon not merely the relative volumes of the sewage and the river, but chiefly upon the power of the river to oxidise the sewage, which power is in proportion to the extent of oxidation of the river itself.

MESSRS. ROBERT BOYLE & SON, Ventilating, Sanitary, and Consulting Engineers, 64 Holborn Viaduct and Glasgow, have been awarded at the Art and Sanitary Exhibition, Eastbourne, the first prize medal (silver) for their systems of ventilation, sanitation, and heating, and their patent self-acting air-pump ventilator; being the only award given for ventilating and sanitary appliances.

THE Health Committee of the Liverpool Corporation recommend the appropriation of twenty-five acres of Wavertree Park as a site for a hospital for infectious diseases. They recommend the erection of a series of buildings with a wide belt of land and trees to secure isolation.

THE SANITARY RECORD.

OCTOBER 15, 1884.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

MUNICIPAL FINANCE.

THE minds of ratepayers in some of our large and more go-ahead cities are beginning to be stirred at the generosity with which their finance committees are spending money on public improvements by means of borrowed money, which the next generation will have to repay. Indeed, the whole subject of Municipal Finance has been receiving considerable attention of late; what with the defalcations of one borough treasurer after another, the granting of annuities on what have eventually proved to be ruinously improvident terms, and the ambition of corporations to administer everything themselves—from the supply of water to immense areas to the making of patent manure, from the establishment of art schools to the running of a hotel—Nottingham is an excellent example of the spread-eagleism now rampant in some of our large towns, and its recent prominent position in connection with the extension of university teaching and in other ways invests its balance-sheet with a more than local interest. The *Nottingham Journal* has been indulging in reflections as to the expenditure of the present and the past, and prints some very interesting figures which serve to show the developments of municipalities during the present century. The total expenditure out of the Nottingham Town Rate in 1803 was but 2,983*l.*, and in 1807 it was 2,901*l.* In the year ending March 25, 1884, the amount raised by the district rate for town purposes was 142,190*l.* besides 20,300*l.* taken from the gas and water profits, 9,970*l.* received from rents of the Chamber Estate, and 9,629*l.* rents of the Bridge Estate. At the beginning of the present century when the town expenditure was such a small affair, sewage farms, university buildings, school boards, castle museums, recreation grounds, the police system, gas lighting, and sanitary arrangements, such as now exist, were unknown. Last year the cost of the police force alone was 20,114*l.*, including 1,375*l.* for clothing and accoutrements, this latter item being about as much as was paid to the constables altogether eighty years ago. No charge appears in the accounts of 1803 for lighting the town, whereas last year the cost of public lighting came to 10,488*l.* Nottingham, at the beginning of the present century had no occasion for public recreation grounds, for the town was then small, and surrounded by Lammas land, over which the public had the right of roaming at will during many months in the year. Now all is changed, and its recreation grounds cost pretty nearly 4,000*l.* a year in maintenance alone, besides 2,400*l.* which is spent on the Castle Grounds and Museum in excess of the receipts. In 1807 the town authorities did not concern themselves with sanitary matters, but last year the Health Committee

took 28,343*l.* for their operations; the Works and Ways Committee nearly 35,000*l.*; and the School Board for education purposes about 19,000*l.* In 1807 the ratepayers of Nottingham were in blissful ignorance of the meaning of a Town Debt, and beyond an occasional small overdraft at the bankers had few liabilities. Now the town authorities have just placed a second loan of a million sterling, and the amount, which figures in the accounts of the last financial year for loans and interest was 36,616*l.* The town now spends thousands of pounds on new drainage schemes, managing the Sewage Farm, and other matters too numerous to mention. In 1807 the town expenditure was 2,901*l.*, whereas the estimate for the current year is 212,763*l.* In the first-named year the population of Nottingham was a little over 28,000, and the cost of municipal government came to about 2*s.* a head; now the population is estimated at 205,000, and the cost of municipal government exceeds 1*l.* a head, besides a debt amounting to about 9*l.* 1*s.* for each inhabitant. It is evident, says our contemporary, that if the inhabitants of Nottingham to-day enjoy greater advantages than their ancestors they are called upon to pay more than double what their ancestors used to do.

VENTILATION OF PUBLIC BUILDINGS.—Messrs. Robert Boyle & Sons, 64 Holborn Viaduct and Glasgow, have just applied their Patent Self-Acting Air Pump Ventilators, and system of ventilation, to the Inland Revenue Department, Somerset House; Gresham Hall, Brixton; University College, Bangor, North Wales; Council Room, Barnsley; Masonic Club, Landport; Alexandra Club House, Southend; Free Library, Northwich; New Offices, Edmonton Local Board of Health; York Institute, York; Carr & Company's New Stables, Carlisle; New Factory for the Ekman Pulp and Paper Company, Northfleet; 'Lillehurst,' 'Simonstown Hawes,' 'Shrubland Park,' and Muncaster Castle, residences of the Duke of Sutherland, Lord Wharnclyffe, Sir G. Brooke Middleton, Bart., and Lord Muncaster.

INFANT LABOUR IN FRANCE.—In his report to the President of the French Republic upon the results of the inspection of manufactories in order to see that the law as to infant labour is carried out, M. Corbon, President of the Committee of Inspection, gives some interesting information as to the working of this measure, which was only passed in 1874. The number of establishments inspected last year was 46,314, and though this is nothing like all the manufactories and workshops in which children are employed, there has been a steady increase since the law first came into force. The establishments inspected are of every kind, but the law makes an exception in favour of charitable institutions and establishments belonging to the State, exceptions of which the president of the committee questions the expediency. The number of children in the 46,314 establishments inspected last year was 213,001, and it is pointed out that there is a marked falling off in the total of children employed in these establishments, this being attributed in part to the fact of their parents finding more lucrative employment for them, in part to the operation of the law of 1882 with regard to compulsory education. The law of 1874 fixed twelve as the minimum age at which children were to be employed in manufactories and workshops; but an exception was made in favour of one or two light kinds of work, when ten was the minimum age. But while only 7,780 children were so employed in 1875, the total has gradually dropped, and was only 4,254 last year. The inspectors report that the rules as to Sunday and night labour are generally well observed, but that there is great delay in informing them of the accidents which may occur, and of which there were 175 last year.

NOTES OF THE MONTH.

THE HASTINGS HYDROPATHIC ESTABLISHMENT AND SPA.

HASTINGS, one of the most charming and favourite resorts on the south coast, has now been provided with a first rate hydropathic establishment. This has been done by a company under the Limited Liability Acts, with a board of five directors, one of whom, Mr. Liddiard, the chairman, has visited and carefully inspected nearly every similar institution of any note, the result being that every improvement has been introduced, and everything done to make the Hastings establishment one of the most perfect in the kingdom. It was formerly the residence of Mr. Frederick North, M.P. for the borough, and has been taken on lease for forty years with the option of purchasing the freehold. The mansion stands in five acres of well wooded grounds, in which there is a valuable mineral spring, similar to the far-famed Tunbridge Wells spring, but containing a somewhat smaller quantity of iron, in a most beautiful situation on a slope in the Bourne Valley; well sheltered from north and east winds by the surrounding hills, with extensive and uninterrupted views, and within a few minutes' walk of the parades and principal part of the town. The baths are as complete as money, capital, and skill can make them, the water supply is abundant and good, and the sanitary arrangements are perfect. The public rooms are large, commodious, and fitted with every convenience, in addition to which there are several elegantly furnished private sitting-rooms with bedrooms *en suite*. The Hastings Hydropathic Establishment and Spa is not intended for confirmed invalids, and patients suffering from mental or infectious diseases, epilepsy, or dipsomania are not received upon any terms.

PENNY DINNERS FOR BOARD SCHOOL CHILDREN.

IN reference to this question, Mr. Jonathan Taylor, member of the Sheffield School Board, communicates his experience in providing penny dinners to the *Schoolmaster* of Sept. 13. He writes:—'In the month of June last the Sheffield School Board set apart two rooms in one of its schools, situate in the poorest district of the town, one of which has been fitted up as a kitchen, and the other for a dining-room, the expenses incidental to the same being provided by a committee who, apart from the board, undertake the entire management, finance and otherwise. The dinners are open to every child attending the schools, no questions being asked as to the position of parents, and consequently no invidious distinctions are made. A few minutes after twelve o'clock a teacher from each department marches the pupils from his or her school into the dining-room, where the cook has already got the tables covered with nice clean white cloths, bright spoons and forks, with an abundant supply of pure water to drink. The dinner consists of two courses, and is varied from day to day, but the following will fairly indicate both the quantity and quality and cost of the provision made:—

'DINNER FOR 200 CHILDREN.—SOUP.—7 lbs. 2 ozs. of Australian beef, at 5½d., 3s. 2d.; 4 lbs. of flour, at 1½d., 5d.; 36 lbs. of potatoes, at 5d. per stone of

14 lbs., 1s. 1d., 2 lbs. 6 ozs. of rice, at 1½d., 3½d.; 1½ lbs. of onions, at 1½d., 2d.; pepper and salt, 2d.; total, 5s. 3½d.

'JAM PUDDING.—28½ lbs. of flour, at 1s. 5d. per stone of 14 lbs., 2s. 11d.; 2 lbs. 6 ozs. of suet, at 7½d., 1s. 6d.; 8 lbs. 5 ozs. of jam, at 2½d., 1s. 9d.; baking powder, 2d.; 1 lb. of sugar for sauce, 2d.; salt, ½d.; total, 6s. 6½d.

'It will be seen from the above that for a total cost of 11s. 9½d. a good, wholesome, and substantial dinner can be provided for 200 children, which is a little less than ½d. per child, and from an experience now extending over some weeks, I can assure your readers that the provision is ample. Of course to this must be added cost of fuel and cooking, which will vary a little in each locality.'

These practical details of cost will be useful to committees desirous of extending the system of supplying penny dinners now under trial. (*See SANITARY RECORD for Sept. 15, p. 122.*)

A PREMIUM ON INFANTICIDE.

A RECENT letter to a daily contemporary draws the attention of the public to an evil, the existence of which is only too well known to those who have any acquaintance with the lives of the poor. The writer, signing himself 'M.R.C.S.', cites a case coming under his own notice, and which is doubtless typical of many in the experience of other practitioners. An infant (he says) was brought to him with a slight ailment, from which it would have soon recovered had it been properly cared for. However, after two or three days it died, and inquiries were instituted, showing that it had fallen a victim to the pernicious system of infant life insurance which prevails in most large towns. As soon as a child is born its parents obtain a policy on its life, and from a half-penny to twopence (according to the sum insured) is paid weekly to the collector of the insurance office, who is grimly known on his rounds as 'the dead man.' The policy is void if the child dies within three months, but when once this minimum age is reached the sum insured is paid by the office on the production of a certificate of the child's death. In the case referred to about 1s. 6d. in weekly pennies was the amount paid in, and the parents received 1l. 5s., a sum much beyond the cost of burying an infant among the poor. The system unquestionably puts a premium on infanticide. It is not only easy to get an infant insured, even though it be weak or sick, for one society's 'dead man' competes with another society's 'dead man,' and both are paid according to the amount of business done; but little or no inquiry is made after death for fear the society should get a 'bad name.' Then comes the temptation to the vicious or the very indigent—that the child's death represents an immediate money gain. The temptation is ever present, and leads to carelessness or actual neglect, or to the use of one of the many poisons which can be obtained with such easy facility under the names of cordials, or carminatives, or soothing syrups. Such preparations are patented, and can be sold by any huckster who chooses to pay a few shillings for his licence; and with them is sold a salve for the poisoner's conscience, for are they not all recklessly labelled as 'perfectly harmless'? And unless the neglect is very gross, or the overdose of carminative very large, the medical man is powerless. There is no positive proof. Mere suspicions will not warrant

further inquiry; and if they should, the coroner commonly takes a merciful view of the matter.

The statements of 'M.R.C.S.' have evoked a letter from 'A General Practitioner,' who endorses the view that the wholesale insurance of infants is one of the causes of excessive infant mortality in this country. He says that policies are issued on lives of children concerning whose state of health at the time no inquiries whatever are made. Though there is thus no care in the selection of lives, the companies thrive, as a considerable percentage of the policies are forfeited on account of the weekly payments not being kept up, the amounts paid being forfeited also. The whole system seems utterly bad.

PIPE SEWERS IN COLUMBIA.

IN every part of the city of Columbia, where pipe sewers have been laid for a number of years, portions of them are found more or less obstructed by the roots of trees, in some instances quite filled with them. The pipes were laid without foundation of any kind upon firm ground. In process of time the leakage from the joints softened the ground beneath them, and the weight of the covering earth in the trench forced the pipe down irregularly into the softened ground. A small amount of settlement sufficed to open the joints, and the fine roots of trees found ready access to the interior. Here they grew and multiplied rapidly, arresting and collecting sand and clay brought in by storms, until the pipe was completely choked up, and a section of it looked like a section of a large flower-pot in which a plant has been growing for a long time.

DANGEROUS STAIRCASES.

AN inquest was recently held as to the death of a man from injuries sustained through falling downstairs at Corporation Buildings in Farringdon Road. It was stated that he had had a little drink but was not drunk, and the accident was entirely owing to the dangerous state of the staircase. Upon examination it will be found that this was unhappily the case, as many serious defects are in existence, and many falls are thereby occasioned from time to time. These buildings are 'model dwellings,' belonging to the Corporation of the City of London, and it is very discreditable that such a state of things should be allowed to continue, more particularly when (according to tenants' statements) complaints have been frequent. The staircase is spiral, and the steps therefore are narrower at one end than at the other; this form though frequently used is very objectionable and dangerous, especially when serving a large number of tenements. The width of the tread at the widest part is 14 inches and at the narrowest about 6 inches, not 3 inches as stated at the inquest. To make matters worse, however, the surface is very slippery, the material of which the steps are made being a concrete of cement and 'breeze' which is generally used for work of this class, on account of its cheapness and durability. The concrete is finished with a very fine surface and becomes absolutely polished by wear. The edge of the top step is rounded off in a particularly dangerous method by having an iron nosing, and as far as can be ascertained, it was from this particular step that the deceased fell. There is no handrail on either side to help the victims (we use the term advisedly), and those who have to pass on the inner side run

constant risks without a chance of saving themselves. There is plenty of light to the stairs during the day; and although (as is usual in places) gas is provided, it is only lighted on the evenings of the winter months—viz., from Christmas to Lady-Day. The fact that the accident happened when it was light only serves to the evils adverted to, and to warrant the remark by the jury that they considered that they had shown great negligence in the matter, recommended that a handrail should be put up. As regards the slippery state of the steps, the use of nosing of different material can be suggested. This should have a rough surface to form a foothold, and when worn away or defaced it can easily be replaced. Such things are done in other places, why not here? Human life is cheap, but the Corporation need not be the means of allowing it to be wasted.

Another inquest was held respecting the death of a child—a girl seven years of age, residing at Minton Road Block of the Palatinat, 12 Minton Road, who was killed through falling down a staircase. The evidence showed that the child had been in the habit of sliding down the stairs, and on this occasion she had fallen over the railing, so fracturing her skull. The coroner observed that he had had occasion to hold inquiries into the deaths of children who had met with their deaths in the same buildings in a similar manner, and that on each occasion recommended that iron spikes should be fixed on the handrails to prevent sliding down them. He was sorry to say that such a commendation had not been carried out. The jury agreed with the coroner's observations, and expressed an opinion that the staircase buildings in question were nothing short of traps, the banisters at some points being broken over two feet in height. Although in this case the death of the child was in a measure owing to her own doing, there is no excuse for the owners in allowing such a result to be possible. Projects for putting spikes sufficient to prevent sliding, yet not injuriously to the hand, could with a little thought be fixed; and it is to be hoped that the coroner's representations will not again be looked at, and it must be remembered that cases of negligence on the part of the proprietors may be of proportions of greater magnitude than they are, and from the consequences of which they should be always exempt.

Still another case is reported from Univer College Hospital, that of a woman, 60 years of age, who lived at 88 Cleveland Street, Middlesex. When going out to buy some articles for her shop, going downstairs, which had neither handrail nor rope, she fell, sustaining injuries which necessitated her removal to the hospital, where she died. The house surgeon stated that when admitted she had a superficial wound on the face and a broken wrist. The *post mortem* examination showed a fracture of the skull and internal hæmorrhage thereon. The jury returned a verdict of death, adding a rider that they strongly advised the landlord to remedy the defect in the staircase to prevent the repetition of such a fatal case. Such cases, which unhappily are only too common, are a gross disregard of the ordinary interests of tenants, and, although in the lower class tenements such fixtures as wooden handrails are commonly destroyed and used as firewood by the owners,

no excuse for the proprietors and landlords to evade moral responsibility, as rope or iron can easily be made, and comparative of life and limb thus obtained.

THE DANGERS OF THE STREETS.

Many well-known dangers to pedestrians on streets may be added the defective or irate of the kerb to the pavement. We are so accustomed to good and level paving that occasional inequality of the surface is often met with at any rate disagreeable results, and the expected height for a footstep is quickly gained. A boy four years of age ran across the road at Alscot Road, and attempted to step—only for him to have been almost to climb—upon the kerb, which was nine inches high, and in so doing he stumbled and fell in the gutter; and a van passing along at the time caught the poor little notwithstanding the driver's efforts to avoid him, and he became crushed between the rear wheel of the van and the kerbstone. He was taken to a neighbouring surgery, but sank rapidly, and died two hours after from the injuries received. The jury returned a verdict of 'Accidental death,' finding the driver of the horses and van from blame. The fault, then, may be partly attributed to the unusual height of the kerb, which usually is only six to eight inches deep, and should rarely be more. It is of course deepest at the crossings—that is, if the road be level, as must be made for running off the water. The steps vary from five to seven inches in height, and an extra inch or two is the cause of inconvenience; and in the dusk or dark the danger may be attended with serious consequences even to adults. In a position like this it is doubly dangerous, and the attention of the vestry may be called to it with advantage.

MACHINERY ACCIDENTS.

A fatal accident through machinery is detailed from Rotherhithe. An engineer and thirty-seven years of age, was discovered in the cockpit of the engine in a fearfully mutilated and quite dead. The chief engineer stated that there was a guard protection at one end of the machinery but not at the other, as there was no necessity for it. The deceased had no occasion to work by means of a can, as the working was supplied with oil by means of a lubricator, and could only account for the occurrence by the fact that he deceased in feeding the crank had his shirt or coat caught in the machinery and got whirled round the crank wheel. In his statement the engine been fenced in, it would not have prevented the accident. The deceased had previously been cautioned not to place his hand on the crank-bearing as he was in the habit of doing. The fault of the unfortunate man is evidently to be attributed to his own carelessness and not to any precaution on the part of the employers, or warning from his fellow-workmen, who are liable at any moment to fall victims to wantonly neglect or forgetfulness. An immunity from harm for any length of time renders a man unable to see any appreciable risk in doing that which he has done so often before, and were it not

for the safeguards that are enforced, and the personal supervision usually exercised under these circumstances, the inevitably long list would yet be greatly increased. The recent returns of the inspectors whose duty it is to inquire into the cause and extent of such accidents, show that notwithstanding the care that is taken on behalf of those who will not take care of themselves, the number of accidents does not show any material tendency to decrease. The senior metropolitan inspector has recently stated that many accidents are caused through the inattention of women to their dress. Their loose sleeves and dress come in contact with shafting and driving straps, often inflicting severe injuries, and of course resulting in death at times, whereas if properly fitting garments were worn, and the arms encircled with a close sleeve, many of those accidents would probably have been prevented. It is also shown that in these hurrying and driving times, that a large number of accidents are caused by the eagerness of workpeople to get through their work, and workers are urged on by overlookers who are interested in the quantity turned off. Competition, healthy and desirable in its way, becomes a curse when human life is put in the scale against a few shillings, perhaps, or even less. But such it is, and being so, too watchful a guard cannot be kept, and the provisions of the Workshop and Factory Acts cannot be too stringently enforced to protect the helpless or careless. These latter have also much to answer for, as many workpeople are injured or killed in consequence of their playing with machinery in motion, wantonly placing in jeopardy their lives and limbs in mere bravado. It has been rightly said that no efforts should be neglected to prevent the deaths and mutilations which seem, by an unfortunate kind of fatalism, to be regarded as an inevitable tribute paid to industry.

THE PUBLIC HEALTH

DURING SEPTEMBER 1884.

THE mean temperature during the month of September at the Royal Observatory, Greenwich, was $59^{\circ}3$; it exceeded by $2^{\circ}8$ the average September temperature in one hundred years, and was $2^{\circ}5$ above that recorded in the corresponding month of 1883. An excess of temperature prevailed on seventeen days of the month, while on the other thirteen days it was below the average. The warmest day of the month was the 17th, when the mean was as high as $70^{\circ}0$, and no less than $12^{\circ}9$ above the average; the coldest day was the 4th, when the mean was only $52^{\circ}5$, and $7^{\circ}2$ below the average. Rain was measured at Greenwich on twelve days during the month, to the aggregate amount of 2.1 inches, which was 0.3 of an inch below the average September rainfall in sixty-one years. During the first eight months of this year the rainfall amounted to 13.5 inches, which was more than four and a half inches below the average rainfall in the same period of sixty-one years. The sun was above the horizon during 376.9 hours in September, and 119.1 hours of bright sunshine were recorded at Greenwich; this amount exceeded that registered in the corresponding period of any year since 1880. South-westerly winds prevailed during the first week of September, after which until the 21st, the wind was easterly; it was again south-westerly during the last week of the month.

In the twenty-eight large English towns dealt with by the Registrar-General in his Weekly Returns, which have an estimated population of nearly eight millions and three-quarters, 23,080 births and 14,359 deaths were registered during the four weeks ending the 27th ult. The annual birth-rate, which had declined

from 35.5 to 33.3 per 1,000 in the four preceding months, rose again to 34.4 during September, and exceeded by 1.1 the rate recorded in the corresponding month of the preceding year, 1883. In these twenty-eight towns the lowest birth-rates last month were 26.8 in Bradford, 28.3 in Brighton, and 28.4 in Huddersfield; in the other towns the rates ranged upwards to 41.0 in Sunderland, 44.4 in Blackburn, and 45.9 in Newcastle-upon-Tyne. The birth-rate in London last month did not exceed 33.3, while it averaged 35.3 per 1,000 in the twenty-seven provincial towns.

The annual death-rate in the twenty-eight towns, which had been 19.3, 22.8, and 24.2 per 1,000 in the three preceding months, declined to 21.4 during September, owing chiefly to the decreased fatality of diarrhoeal diseases; this rate, however, exceeded those recorded in the corresponding months of 1882 and 1883, which were 20.3 and 19.5 per 1,000 respectively. The lowest rate of mortality last month in these towns was 15.6 in Brighton. The rates in the other towns, ranged in order from the lowest, were as follow:—Derby, 16.5; Birkenhead, 17.5; London, 17.7; Portsmouth, 18.0; Plymouth, 19.5; Bristol, 19.7; Huddersfield, 19.7; Bradford, 22.3; Oldham, 23.5; Norwich, 22.5; Nottingham, 23.1; Birmingham, 23.3; Newcastle-upon-Tyne, 24.1; Sunderland, 24.5; Leeds, 25.1; Halifax, 25.2; Salford, 25.3; Sheffield, 25.8; Manchester, 26.6; Liverpool, 27.1; Hull, 27.6; Bolton, 27.9; Wolverhampton, 28.1; Leicester, 28.3; Cardiff, 29.9; Preston, 30.7; and the highest rate during the month, 31.9 in Blackburn. While the death-rate in London during September, as above stated, did not exceed 17.7 per 1,000, it averaged as much as 24.5 in the twenty-seven provincial towns, in many of which diarrhoeal diseases were very fatally prevalent throughout the month. The 14,359 deaths from all causes in the twenty-eight towns during the four weeks of September included 3,275 which were referred to the principal zymotic diseases, of which 2,146 resulted from diarrhoea, 277 from scarlet fever, 254 from 'fever' (principally enteric), 242 from whooping-cough, 183 from measles, 127 from diphtheria, and 46 from small-pox. These 3,275 deaths were equal to nearly 23 per cent. of the total deaths, and to an annual rate of 4.88 per 1,000. This zymotic rate, though it showed a decline from the very high rates in the two preceding months, exceeded that recorded in the corresponding month of either of the two previous years 1882-83. The zymotic death-rate in London during September was but 3.1 per 1,000 (of which 1.6 was due to diarrhoea), while in the provincial towns it averaged as much as 6.4 per 1,000, of which 4.6 was due to diarrhoea. The zymotic death-rates in the provincial towns ranged from 1.9 in Plymouth, 2.4 in Brighton, and 2.6 in Portsmouth, to 9.2 in Bolton, 10.4 in Hull, 10.5 in Blackburn, and 10.7 in Preston.

Diarrhoea was the most fatal zymotic disease in the twenty-eight towns during September. The rate of mortality from this disease in the large towns, which had been 3.67 and 4.97 per 1,000 in the two preceding months, declined to 3.19 during September, but considerably exceeded that recorded in the corresponding period of either of the two previous years, when it was 1.75 and 2.00 per 1,000, respectively. While the diarrhoea death-rate did not exceed 1.56 per 1,000 in London, it averaged as much as 4.58 in the twenty-seven provincial towns, among which it showed very wide divergences; for, whereas the rate of mortality from this disease did not exceed 1.21 in Plymouth, 1.47 in Portsmouth, and 2.05 in Halifax, it ranged upwards in the other towns to 7.21 in Preston, 7.37 in Leicester, 7.77 in Hull, and 8.97 in Blackburn. The death-rate from scarlet fever, which in the two previous months had been 0.44 and 0.38 per 1,000, was 0.41 in September; this disease was much less fatal in London than in the provincial towns, among which the highest rates were 1.24 in Leeds, 1.82 in Sheffield, and 2.09 in Cardiff. The rate of mortality from 'fever' (principally enteric or typhoid),

which had steadily increased in the four previous months from 0.22 to 0.32 per 1,000, further rose during September to 0.38. In London the rate of mortality from this disease did not exceed 0.28 per 1,000, while in twenty-seven provincial towns it averaged 0.32. It showed the highest proportional fatality in St. Preston, Salford, and Hull. The death-rate from whooping-cough, which had steadily declined in the five months from 1.10 to 0.43 per 1,000, further fell to 0.36, which almost corresponded with the rate recorded in the same period of 1883. In London the rate of mortality from this disease was 0.32, and in provincial towns it averaged 0.39 per 1,000, equal to 0.64 in Leeds, and 0.99 in Birmingham. The death-rate from measles showed a further considerable decline from the rates recorded in the three preceding months; this disease was, however, somewhat prevalent in Halifax, Preston, and Bolton. The rate of mortality from diphtheria showed a considerable increase; it was more than twice as high in London as in the aggregate of the twenty-seven provincial towns. During the four weeks of September 46 fatal cases of small-pox were registered in the twenty-eight towns, showing a considerable further decline from the 100 recorded in the three preceding months; of these, 5 occurred in London, 5 in Liverpool, 3 in Sheffield, 1 in Hull, and 1 in Sunderland. Judged by the returns from the Metropolitan Asylum Hospitals, the prevalence of small-pox in London showed a tendency to increase during September. The number of small-pox patients under treatment in these hospitals, which had been 1,000 and 539 at the end of the three preceding months, rose to 536 at the end of September. The average number of new patients admitted to these hospitals had declined in the three previous months from 1,000 to 536, but rose again during September to 84.

The rate of infant mortality in the twenty-eight towns, measured by the proportion of deaths under one year of age to births registered, was equal to 202 per 1,000 in September, against 172 and 185 in the corresponding periods of the two preceding years, 1882 and 1883. The excess of infant mortality was entirely due to the fatality of summer diarrhoea. While the infant mortality in London did not exceed 149 per 1,000 in September, it averaged as much as 242 in the provincial towns, among which it ranged from 138 in Derby, 144 in Portsmouth, 144 in Birkenhead, to 312 in Halifax, 332 in Preston, and 332 in Leicester.

The death-rate from diseases of the respiratory system, judged by the metropolitan returns, was below the average during September. The weekly number referred to these diseases in London averaged 2.1 per 1,000; the annual death-rate was equal to 2.1 per 1,000. In Liverpool the annual rate of mortality from these diseases was last month equal to 2.4 per 1,000.

The causes of 315 of the 14,359 deaths registered in the twenty-eight towns during the four weeks of September were not certified, either by registered medical practitioners or by coroners. These uncertified deaths were equal to 2.2 per cent. of the total deaths, which was slightly above the average in recent months. In London the proportion of uncertified deaths did not exceed 1.32 per cent. In the twenty-seven provincial towns the proportion averaged 2.73, ranging from 0.0 in Leicester and 0.5 in Portsmouth, to 4.5 in Sheffield, 4.6 in Huddersfield, and 9.9 in Oldham.

Among the population living in the outlying suburban districts around London, estimated at more than a million persons, the death-rate during September from all causes was equal to 16.8 against 16.0 and 15.5 in the corresponding months of 1882 and 1883. During the four weeks ending September 15, 170 fatal cases of diarrhoea, 25 of whooping-cough, 23 of small-pox, 20 of diphtheria, 13 of measles, and 11 of scarlet fever were recorded in the district. These 273 deaths were equal to an annual

Table Showing Sickness and Mortality in Large Towns of England and Scotland During the Month of September 1884.

Towns.	Estimated Population Middle of 1884.	Small-pox.		Scarlet Fever.		Diphtheria.		Typhus Fever.		Enteric Fever.		Cholera.		Relapsing Fever.		Puerperal Fever.		Totals of Preceding Columns.		Annual Rate per 1,000 Persons Living.		Deaths from other Zymotic Diseases.				Total Mortality from all Causes per 1,000 Persons Living.
		Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Ill-defined Fever.	Measles.	Whooping-Cough.	Dysentery.	
Aberdeen	211,242	—	—	13	3	4	1	—	—	2	1	—	—	—	—	—	—	31	4	3.30	0.44	—	4	13	7	30.23
Accrington	34,600	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	7	1	2.50	0.36	—	12	4	13	30.83
Barrow-in-Furness	59,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Birkenhead	90,870	17	1	26	—	1	—	—	—	15	5	—	—	—	—	—	—	6	—	8.03	0.86	—	—	—	—	17.14
Blackburn	110,500	—	—	23	2	—	—	—	—	28	4	—	—	—	—	—	—	51	6	6.02	0.71	—	5	—	65	28.55
Blackpool	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bolton	108,968	—	—	30	—	—	—	—	—	18	3	—	—	—	—	—	—	—	—	5.86	0.60	—	—	—	—	—
Bradford	509,564	—	—	61	3	1	1	—	—	28	7	—	—	—	—	—	—	95	11	5.60	0.68	—	—	—	—	—
Burnley	66,000	—	—	27	5	—	—	—	—	16	1	—	—	—	—	—	—	43	6	6.79	0.95	—	—	—	—	—
Burton-on-Trent	44,044	—	—	5	—	2	1	—	—	9	1	—	—	—	—	—	—	16	3	4.42	0.83	—	7	2	14	17.40
Bury	57,162	—	—	4	—	—	—	—	—	6	1	—	—	—	—	—	—	10	1	2.28	0.23	—	—	—	—	22.81
Chaderton	17,503	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Derby	87,108	—	—	34	1	—	—	—	—	47	2	—	—	—	—	—	—	81	3	12.65	0.45	—	—	—	—	16.52
Dundee	150,323	—	—	59	1	10	10	—	—	7	—	—	—	—	—	—	—	89	14	7.20	1.13	—	6	14	41	23.21
Edinburgh	2,061,5	—	—	89	5	6	2	3	1	87	9	—	—	—	—	—	—	165	17	8.01	0.83	—	1	19	29	16.46
Greenock	79,611	—	—	22	2	4	4	1	—	27	2	—	—	—	—	—	—	55	9	7.00	1.29	—	1	5	10	2.11
Halifax	77,000	—	—	31	2	3	—	—	—	6	2	—	—	—	—	—	—	44	4	7.11	0.63	—	7	2	9	26.02
Hartlepool	18,000	—	—	2	—	—	—	—	—	3	—	—	—	—	—	—	—	5	—	3.38	0.00	—	—	—	—	23.66
Heywood	25,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Huddersfield	86,004	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jarrow	29,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lancaster	22,210	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Leek	13,354	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Leicester	152,773	—	—	68	—	3	1	—	—	17	—	—	—	—	—	—	—	88	1	8.64	0.10	—	1	4	86	28.09
Llandudno	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Macclesfield	37,461	—	—	3	—	—	—	—	—	2	—	—	—	—	—	—	—	7	—	2.27	0.00	—	—	—	8	20.14
Manchester	338,296	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	26.57
Newcastle-on-Tyne	451,325	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24.14
Norwich	90,410	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22.50
Nottingham	205,298	—	—	27	1	—	4	—	—	52	8	—	—	—	—	—	—	79	13	5.02	0.83	—	—	9	67	23.13
Olham	122,676	—	—	23	2	4	—	—	—	12	5	—	—	—	—	—	—	32	7	4.15	0.74	—	2	2	39	22.33
Portsmouth	133,039	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18.04
Preston	59,481	—	—	15	7	2	1	—	—	47	5	—	—	—	—	—	—	64	13	8.39	1.70	—	—	3	58	27.91
Reading	45,880	—	—	30	—	1	—	—	—	3	—	—	—	—	—	—	—	34	—	9.66	0.00	—	—	—	6	13.92
Rotherham	35,652	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Salford	107,140	—	—	104	14	8	1	10	1	89	12	—	—	—	—	—	—	211	28	13.96	1.85	—	3	6	72	24.87
Stafford	22,250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Stalybridge	26,773	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	1.46	0.00	—	—	—	8	24.83
Warrington	44,512	—	—	2	—	—	—	—	—	7	—	—	—	—	—	—	—	9	2	2.11	0.47	—	12	2	21	22.49

3·3 per 1,000, against 2·8 and 2·3 in the corresponding periods of the two preceding years. The fatality of diarrhoeal diseases, 'fever,' whooping-cough, and measles showed a decline; but the recorded cases of small-pox, scarlet fever, and diphtheria showed a slight increase. Of the 23 deaths from small-pox registered in the outer ring 18 occurred in West Ham sub-district (including 4 of London residents recorded in the Metropolitan Asylum Hospital at Plaistow), 3 in Edmonton, and 2 in Croydon. Six of the 13 deaths referred to fever occurred in the district of West Ham; and of the 20 fatal cases of diphtheria, as many as 9 were recorded in the district of Edmonton.

NOTIFICATION OF INFECTIOUS DISEASES.

THE table on p. 157 contains uniform statistics relating to sickness and mortality in twenty-seven of the thirty-nine urban sanitary districts in England and Scotland in which the notification of infectious diseases is compulsory. The population of the twenty-seven towns for which we are enabled to publish complete statistics for the month of September in the subjoining table is estimated at about two-and-a-half millions of persons. The annual death-rate from all causes during that period in these twenty-seven towns averaged 22·55 per 1,000 persons estimated to be living therein. The death-rates were last month considerably below the average in Birkenhead, Burton-upon-Trent, Derby, Edinburgh, Leek, and Reading; while they showed an excess in Accrington, Blackburn, Bolton, Halifax, Jarrow, Leicester, and Preston. The high rates of mortality in these last-mentioned towns were mainly due to the fatal prevalence of diarrhoeal diseases. The death-rate from the eight infectious diseases, concerning all of which, with but very few exceptions, notification is compulsory in these towns, averaged 0·77 per 1,000 persons living in the twenty-seven towns for which this information is available. No death from any of these diseases occurred during September in Hartlepool, Jarrow, Leek, Macclesfield, Reading, or Stalybridge; in the other towns the rates ranged upwards to 0·83 in Nottingham, 0·83 in Edinburgh, 0·86 in Greenock, 1·13 in Dundee, 1·70 in Preston, and 1·85 in Salford. Small-pox caused 1 death in Birkenhead during September; scarlet-fever was proportionally most fatal in Burnley, Preston, and Salford; diphtheria in Dundee; and enteric fever in Birkenhead, Preston, and Salford. With regard to the notified cases of infectious disease in these twenty-seven towns, it appears that the proportion to the population of persons reported as suffering from one or other of the eight diseases enumerated in the table averaged 6·85 per 1,000. While this proportion did not exceed 1·46 in Stalybridge, 2·11 in Warrington, 2·27 in Macclesfield, and 2·28 in Bury, it ranged upwards in the other towns to 8·03 in Birkenhead, 8·39 in Preston, 8·64 in Leicester, 9·66 in Reading, 12·05 in Derby, and 13·96 in Salford. Scarlet-fever showed the largest proportional prevalence in Derby, Halifax, Leicester, Salford, and Reading; enteric fever in Derby, Preston, Salford, Edinburgh, and Greenock; typhus in Salford; and diphtheria in Dundee, Greenock, and Salford. Cases of small-pox were notified during September only in Birkenhead.

WE are requested to state that Mr. R. S. Dunbar, for many years a partner in the Thames Bank Iron Company, has retired from the firm.

AT the annual meeting of the Tweed Commissioners a committee was appointed to make a comprehensive and exhaustive scientific inquiry into the origin, development, and treatment of salmon disease, and £200 was placed at their disposal. The number of dead and diseased salmon, grilse, and trout taken from the Tweed in the last five years was stated to be 37,969.

SPECIAL REPORTS.

THE SEVENTH CONGRESS

OF THE

SANITARY INSTITUTE

OF GREAT BRITAIN,

Held at Dublin from Sept. 30 to Oct. 4.

THE first general meeting of the Sanitary Institute of Great Britain was held in the Theatre of the Royal Dublin Society on Sept. 30. Amongst those present were—Sir Robert Rawlinson, C.B.; the Right Hon. the Lord Mayor and the Lady Mayoress, Dr. Carpenter, President of Council; Dr. Moore, President King's and Queen's College of Physicians; Dr. E. Mapother, Dr. T. W. Grimshaw, Registrar-General; Professor Corfield; Mr. G. Symons; Mr. Rogers Field, Mr. W. Eassie, C.E., Dr. Louis Parkes, Mr. H. H. Collins, Mr. Ernest Turner, Professor Robinson, Mr. George Sykes, Mr. H. Perry Boulnois; Professor de Chaumont, Mr. Wallace Peggs, Mr. Robert O'Brien Furlong, B.L.; Dr. Duffey, and Dr. Chas. S. Cameron, C.S.S.

Sir Robert Rawlinson, C.B., having taken the chair, proceeded to read his presidential address, of which an abridgment is published at page 127.

STATISTIC MEASURE OF THE HEALTH OF COMMUNITIES.

On October 2 Dr. Grimshaw, Registrar-General, read a paper on this subject, of which the following is an abstract:—Undoubtedly the death-rates published weekly, quarterly, and annually by my colleagues in England and Scotland, and by me in Ireland, are *prima facie* evidences of the relative healthiness or unhealthiness of the population living in each of these, and no doubt a very high death-rate does in nearly every case indicate unhealthiness, and a very low death-rate indicates healthiness of the population to which it refers; but it does not at all follow that a death-rate of, say, 40 per 1,000, indicates double the unhealthiness that a death-rate of 20 does. To speak in common parlance, the high death-rate really indicates that the population to which it refers has a delicate constitution, and that with a low death-rate a robust constitution. The prevalence of infectious diseases and their fatality is a very important element in estimating the health of a community; nevertheless, if the death-rate from any particular group of diseases were taken as a single test of unhealthiness, I should choose the constitutional, not the zymotic, group as the most reliable. If we take London and Dublin, for example, and contrast them as to the relative mortality from particular groups of diseases, we find that the deaths from zymotic diseases were 57 per 10,000 of the population in Dublin, and 51, or but slightly greater in the former than in the latter, in London; whereas the death-rate from constitutional diseases in Dublin was 43, while in London they were only 23, or little more than one half in the same period. Nevertheless, the total death-rate in Dublin was 277, while in London it was 239, or 47 less. Again, the infantile death-rate is much relied on, but a low infantile death-rate is quite consistent with a high general death-rate, as, for instance, happens to be the case of Dublin, where the general rate of mortality is high, but the infantile mortality is comparatively low. Attempts have been made from time to time to estimate what should be the death-rate of a healthy community, but in my opinion all such efforts have been failures, and we are driven to depend upon comparisons of death-rates in various countries with one another, or to comparisons of different portions of the same community with the whole or with one another, as the only test of the healthiness or

healthiness of such communities. Thus the average annual death-rate of the population of England and Wales for ten years, 1871-80, was 21.4; while in London was 22.5. In Scotland it was 21.6 for the same period.

Ireland for the same decade it was 18.3, and varied from 27.5 in Dublin to 14.1 in the rural districts of Munster. Now, do these varying rates truly represent the relative healthiness of the different communities to which they refer? I state, unhesitatingly, they do not: at in some of these districts the people are less unhealthy, other cases more unhealthy, than the rates represent them to be. It has long been known that a very general analogy existed between the density of a population and the death-rate, in other words, where people are packed closely together that we expect to find a high death-rate. This at first sight appears to be a mere truism, but I am glad to say that the old sanitary, or unsanitary maxim, 'that a dense population has a high death-rate,' is coming less true every day, as it has been proved by the operations of artisans' dwellings companies and others who have undertaken to provide dwellings for the working classes, that with reasonable precautions very dense populations can enjoy very good health and have very low death-rates. Unfortunately, however, this old maxim has considerable degree of truth still left, and statistics show that there is a correspondence between high death-rates and density of population. It is a matter of the utmost importance, when applying death-rates as a test of health, that the relative numbers of the population belonging to each social class should be known. The variations in the death-rate between the classes and the sub-classes is remarkable. For example, in the 'professional class' the death-rate is but 19.8 per 1,000, while in the 'general service class' it is 36.8, or nearly double. Among domestic servants it is but 9.1, while among labourers it is 34.4, although both are drawn from the same stratum of society. The number of persons living at different ages differs materially in different communities. From the statistics it would appear that the number of very young people in England is relatively much greater than in Ireland, the number of children under five years being 35.5 per 1,000 inhabitants in England, as compared with 11.3 in Ireland. In the case of infants under one year it is more remarkable, there being 29 'babies' in England to 0.3 in Ireland, a fact which is at variance with commonly received opinions. At the other extreme of life we find that there are more old people in proportion in Ireland where those above 60 number 106.2 per 1,000 of the population) than there are in England, where they number about 73.8 per 1,000. Now, as very young children die at a greater rate than older children, or persons in middle life, we might expect the death-rate of England to be much higher than Ireland, but it is only a little higher. And why is this? Because the old people, whose lives are also precarious, are more numerous in Ireland than in England. In both countries the highest death-rate is among children, the deaths under one year being 109.4 per 1,000 living at that age in Ireland, and 152.7 per 1,000 in England, as compared with the general death-rate of 17.4 and 18.9 respectively. The death-rate steadily decreases as age increases, until the age period of from ten to fifteen years is reached, when the rate reaches the maximum both in Ireland and England, being 37 in Ireland and 3.3 in England. It will be observed that in nearly every instance the death-rate of Dublin is somewhat in excess of that of London. In many diseases the excess is small. Thus, in the case of the zymotic diseases, the excess of Dublin over London is not, proportionately, nearly so great as in the case of constitutional diseases. In the former case the ratio is 57.1 to 50.6; in the latter 52.3 to 42.9. Among the constitutional diseases we find that the death-rate per 10,000 from phthisis or pulmonary consumption alone is 31.6, against 25.1, and closely connected with this we find that the death-rate from diseases of the respiratory organs is 55.8 in Dublin, against 47.5 in London.

THE ADMINISTRATION OF THE PUBLIC HEALTH ACT IN IRELAND.

Dr. Edgar Flinn, surgeon to St. Michael's Hospital, Kingstown, read a paper on the administration of the Public Health Act in Ireland with regard to the duties of the officers of health. He said the working of the Public Health Act in this country has, in a great majority of districts, well-nigh become a dead letter. One of the main causes of the slow progress of sanitary reform in Ireland is that there are no local boards or combinations of districts. The boards of guardians, the sanitary authorities for the rural districts, are not, as a general rule, opposed to sanitary reform, yet they are never anxious to move in any measure of sanitary work that will cause outlay. The reports of medical officers of health are frequently left unread, and treated as waste paper. In England such reports are read, discussed, and their suggestions promptly acted upon. The indications were numerous that the Local Government Board in Ireland would soon have seriously to take up the question of combinations of districts and unions for the appointment of a medical officer of health. In lieu of having six or more medical officers of health in each district, with a superintendent medical officer of health, there should be one, and only one, medical officer of health, who should be a man free from the cares of practice, and whose pecuniary interests would not be perpetually at war with a due and fearless discharge of his duties.

The writer had often heard it said by medical officers of health that they were unable to carry out the Public Health Acts in their districts. In the smaller towns in England greater attention is paid to the sanitary laws than in similar towns in Ireland. In small towns in Ireland, where the town revenue is, perhaps, not much over 50%, the whole of this sum is paid away in salaries of officials, and there is nothing left to be applied to the practical carrying out of sanitary improvements. He could confirm the observations that had been made, that sanitary administration is not properly carried out in most of the small towns in Ireland, and in some of them it is not carried out at all.

Mr. Edward Spencer, M.A.T.C.D., Secretary to the Dublin Artisans' Dwellings Company (Limited), read a paper on—

THE HOMES OF THE WORKING CLASSES IN DUBLIN.

After noticing the difficulties in dealing with the subject by general as distinguished from local legislation, and pointing out that Dublin is, of all cities which have carried out improvements for the housing of the poor, most peculiarly situated, Mr. Spencer proceeded to discuss his subject from a local point of view. In 1871 there were, he said, out of a total number of 58,327 families in Dublin, 44,933, or 77 per cent., living in 10,954 tenement houses, being 4.1 families to each house—the term 'tenement' being applied to all houses, of whatever size, accommodating more than one family. In 1881, out of 54,725 families, 39,997, or 73 per cent., lived in 9,854 tenement houses, or 4.05 families per house. The number of persons to each family had, however, increased from 4.2 in 1871 to 4.5 in 1881. Of 1,100 tenement houses which have disappeared, 1,053, occupied by 4,659 families, contained more than ten rooms, and from two to six families each. It is certain that this decrease would have been much larger but for the constant supply of first-class single houses which have lapsed into tenement houses. The figures also show that while the decrease of families of all classes amounted to 3,538, those occupying tenement dwellings have decreased by 4,948, and that the difference represents 1,413 families who have advanced to single house accommodation. On the whole, continued the writer, we have the broad fact that in 1871, 77 per cent. of the families in Dublin, or 188,769 persons, lived in tenement houses, and that this proportion

was only reduced to 73 per cent., or 182,278 persons, in 1881. With reference to the condition of these houses, it was sworn before the Royal Sanitary Commission on Dublin in 1879 that of 9,760 which then existed, 2,360 were unfit for human habitation, 3,500 were repairable, and 4,000 in a better condition. The want seems, therefore, to be of two kinds—the demolition of old and substitution of new buildings, and the proper maintenance of existing dwellings. Everyone who knows Dublin will be struck by the large number of abandoned houses to be seen in comparatively respectable streets, and will not fail to observe the gradual injury inflicted by the condition of such houses on the adjoining ones. A great many of these houses have been closed by the medical officer of health as unfit for human habitation, or by the surveyor as structurally dangerous. If the medical officer of health and the surveyor certify that the building is past repair and requires demolition and reconstruction, the owner or the local authority must take it down. The decision of these officers is final, and there is no appeal. If the owner elects to take down the house he may leave the site vacant if he wishes, but self-interest will be a sufficient guarantee in that respect. He can, however, call on the local authority to purchase the premises, in which case that body must take down the house, and may either erect labourers' dwellings or lodging-houses, dedicate the site to public health, or sell or let it without any special restrictions. For either of the first two cases they may borrow public money, but no greater rate than 2d. for one year can be levied. The purchase money is to be fixed by agreement or arbitration, and there is no appeal against the arbitrator's award. The greatest bar to the improvement of the homes of the working classes in Dublin is the present anomalous condition of the valuation of property. This affects not only the provision of such dwellings, but the improvement of every class of buildings. The shortest way of indicating the present state of affairs is to give an example from each kind of property, although it might be sufficient to state that there has been no general revision of the valuation of the city for thirty-five years. There have been five commercial houses, in the vicinity of the leading business thoroughfares, lately rebuilt at a total cost of 12,750*l.* Before their reconstruction their valuation amounted to 532*l.*; now it is 925*l.* Taking the rates and taxes at 10*s.* in the *l.*, the increased annual expenditure of the five investors under this head was 196*l.* 10*s.*, or, at twenty-five years' purchase, 4,912*l.* 10*s.*, or 38½ per cent. on their outlay on buildings. Passing to the homes of the working classes, and selecting at random seven tenement houses in various parts of the city, and seven improved dwellings, the valuation of each being the same, viz. 9*l.*, or 63*l.* for all, the annual rental of the old houses being 322*l.*, of the new 118*l.* That is to say, the proprietors of the tenemental dwellings contribute 10 per cent. of their income to the rates, while the owners of the new dwellings pay 27 per cent. of their income to the rates. This inequality presses on the very class we are supposed to be benefiting, as the following facts will show. Mr. Spencer has investigated the present and former rents paid by 427 of the tenants of the Dublin Artisans' Dwellings Company, and finds the present rent to average 5*s.* 3*d.* per week, the former rent 4*s.* 3*d.* Dividing these gross rents into the two items of 'rent' and 'taxes,' and applying the proportion of taxes to rent given above, it will be seen that the 'rent' of the new dwelling is 3*s.* 10*d.* and taxes 1*s.* 5*d.*; while the 'rent' of the tenemental dwelling is 3*s.* 10*d.* and taxes 5*d.* It will therefore be seen that the extra price which the tenant pays for the improved accommodation is made up entirely of increased taxation. As the writer was anxious to illustrate the necessity for preventing the alteration of single dwellings into tenement-houses (either under the Public Health or Tonnage Act, or, if necessary, by new legislation), enforcing structural alterations necessary for its converted state, he selected a house at random in one of the finest thorough-

fares in Dublin, and which has been converted during the past year into a tenement-house, and, through the kindness of Dr. Cameron, medical officer of health, he is enabled to place on record its present condition. The house is occupied by nine families, but is in good order; the cubic space per head is not less than 300 feet, and the house may be taken as a very favourable example of the tenemental dwellings in Dublin. Six rooms are occupied by as many families, containing forty-seven persons, and three rooms are occupied by three families, containing eight individuals. In the back kitchen live a family of six—father, mother, and four sons, the eldest of whom is 17, the youngest 10. The second floor front room is occupied by a family of ten, of which two are men over 25, two boys from 14 to 16, and three women from 23 to 40. In the top front room live another family of ten, comprising two males, one 19, the other 40, and four females, aged 10, 12, 14, and 36; and in the top back live a man, his wife, her mother, and a baby. All of the other rooms are occupied by families with children under thirteen years of age. With those houses which have already been converted without any structural alterations the task of the sanitary authority is much more difficult. While a large number of tenement house owners systematically evade the law in Dublin, there is a large number who honestly endeavour to do their duty, and to encourage whom should be the policy of the sanitary authority. The proceedings necessary to get rid of a tenant and get possession, before the Court of Summary Jurisdiction, occupy five weeks at the least, and practically involve the loss of seven weeks' rent; and the proceedings necessary to get rid of a tenant who pays more than 4*s.* 6*d.* a week occupy on an average three months. During all this time no rent is paid, and the property of the unfortunate owner is liable to the grossest injury without any practical means of redress. It is a well-known fact that there are tenants in Dublin who go from tenement to tenement, never paying one week's rent from year to year, and very often getting money from the landlord to give up possession. The condition of the law on this subject is one of the greatest practical bars to the improvement of the dwellings of the working classes. Within the past eleven or twelve years accommodation has been provided for 2,857 families, representing about 16,000 persons. Although the necessity in Dublin for the demolition of old, substitution of new, and adaptation and maintenance of repairable dwellings is exceptionally great, it must be admitted that within the past few years special efforts have been made, both by the local authority and by public and private enterprise, to meet the necessity, and it is worthy of notice that Dublin is one of three cities in the United Kingdom which have carried out more than one improvement scheme under Sir R. Cross's Acts.

Mr. J. Wycliffe Jones, surgeon-major in charge of Her Majesty's troops at Naas, read a paper on—

THE INSANITARY STATE OF SMALL IRISH TOWNS.

The author said: The deplorably insanitary condition of several small Irish country towns, in which during various periods of my service at home it has been my lot to be stationed in medical charge of Her Majesty's troops, has impressed me so forcibly that I feel moved to submit a brief paper upon the subject.

The fact that the statistics available deal with the sickness and mortality of small towns, only as they form a part of a large rural district, precludes the possibility of fixing the amount of sickness and mortality chargeable to the town itself apart from its surrounding rural district. I feel strongly convinced that the death-rate must be high in many towns I have known, yet upon an examination of the statistics of the area into which such towns were collated I have been astonished to discover a very low rate of sickness and death. This statistical imperfection has a further important bearing: I cannot in justice con-

on the condition of things in any one town as exceeding, evil case, those of any other, for, again, I am unable to give my case. For instance, although the insanitary state of Naas—my present station—is so bad, so deplorably bad, that every essential for healthy life is absent, cannot state from personal observation nor can I prove figures that its condition is in any degree worse than that of many other towns I have formerly resided in. I am therefore content to furnish a brief epitome of the results of several years' observations, dividing these under the several heads of—

(1) Overcrowding. (2) Particular descriptions of dwellings, and rent. (3) Sewerage and conservancy. (4) Water supply. (5) Ablution. (6) General habits and state of the people, and intemperance.

Overcrowding.—In a most wretched, half-ruinous, two-storyed house, containing four simply shocking rooms, I and four families resident—in all, twenty-two souls. My wife—made for the dispensary physician, absent on leave—had for its object the relief of a poor woman in her confinement; and this took place in one of the smallest and worst rooms in this terrible abode, and under such circumstances of appalling squalor and deficiency as made her subsequent recovery a matter of astonishment to me. Another instance: to everyone who has any knowledge of Ireland the form of the Irish cabin will be familiar; the outer room, or kitchen, and the inner room—the 'room' *par excellence*; both floors are clay usually, and the levels lower than that of the street. In winter, damp prevails, but one fireplace is provided, and this utterly devoid of any description of grate. Let us, then, imagine two to three families huddled together upon the two floors.

Other instances will be interpolated between particular descriptions of dwellings, as an essential to that division of the subject, but I am convinced that extreme and cruel overcrowding is a widespread sin of Irish country towns.

Particular Descriptions of Dwellings.—The Irish dwelling is of two classes: the one-storyed clay-floored cabin—I cannot with truth use the cheerful English word 'cottage'; very often in Ireland, cottages are far too scarce—and the two or more storyed house.

I believe that these latter will be usually found to furnish instances of a lower degree of insanitation than even the cabin—vile though it be—and this seems partly to be the result of a belief in the unlimited capacity of any dwelling that possesses several floors. Even though the ground floor be rather crowded by the wretched 'deputy sub-assistant landlord,' his family and guests, there is always 'plenty of room upstairs,' or rather, 'above in the rooms'—'above' conveying to the Irish imagination an almost unlimited degree of storied elevation, provided that the two, four, or sixpence per night be forthcoming. Again, too, the police cannot so easily penetrate, nor can the members of that stalwart corps feel very safe upon the crazy stairs.

The worst descriptions of dwellings are usually to be found hid away in lanes and courts behind the main streets. I will endeavour to describe a small court of dwellings very recently visited. The entrance is in a narrow lane of cabins, and this opens to the main street of the town. Picture then a horrible little courtyard some 50 ft. \times 28 ft., almost completely enclosed by small dwellings; the ash-pits, pigstyes, and back yards of the front row of hovels forming the only prospect possible for those inside the court. The entire block of building does not occupy, to the best of my judgment, nearly one rood of land, nay, indeed, the one-sixth of an acre. Upon this site are built thirteen simply frightful dens, all have damp or clay floors; pools of green and black water lie all around, black typhoid mud, and festering manure in abundance. Some fifty-five to sixty souls live in this court, and many pigs are kept. I measured several, and append a few results. No. 1 house, $5.7 \times 14.2 \times 6.9$ = cubic ft. less than 588; four souls live here. No. 2, $15.7 \times 12 \times 9.6$ = cubic ft. less than 1,800; five souls resident. No. 3, $15.7 \times 10.8 \times 9.6$ = cubic ft. less than 1,500, and eight souls resident.

In the first about 100 cubic feet of foul damp air could be enjoyed, in the second about 300, if no lodgers come for the night, in the third about 142. For the worst description of dwelling 1s. to 1s. 6d. per week is paid, but 2s. 6d., 2s. 8d., and 3s. is very commonly demanded even for cabins, which can, with truth, be described as 'unfit for human habitation.' A very wide field of observation, both in Europe and in India, has not furnished me with any parallel to all this. In no country on the globe has human misery reached so low a degree of degradation. Picture what life must be in such dwellings, and be well assured that I furnish no isolated instance, but a true representation of what is all but universal in Irish country towns.

The worst dwellings are to be found in towns owned by a number of small proprietors. In these, sub-letting of even fairly good houses is carried to a ludicrous degree. A bachelor friend of mine once obtained, with difficulty, in a small country town, two furnished rooms in the same house; but he rented his sitting-room from one landlord, and his bedroom from another. Again, in the instance mentioned of the house in which I found twenty-two souls, two or three landlords were part owners, and the third, *i.e.* who occupied one room—himself and family—drew 8s. 6d. per week from three sets of squalid lodgers. The house pays to various owners about 34*l.* a year, when quite full. I would be sorry to give that sum for the materials of which it is built.

Sewerage and System of Conservancy.—My experience leads me to the strong belief that under this head every sanitary rule is almost universally violated. Having regard to the towns at large I am unable to remember one where an efficient system of drainage and sewerage exists.

Latrines, &c.—Then, as to latrine accommodation, it is notorious that none whatever is provided for a very large number of the humbler dwellings in Irish towns; while even houses of a better class are vilely provided. The state of deplorable degradation engendered cannot be exaggerated. Connected with this subject I must speak of the intense nuisance created in the horrible labyrinth of back yards seldom absent in Ireland. Here pigs and horses are kept; often, too, no back-lane entrance exists, and at potato sowing time I have often seen two or three cart-loads of festering black typhoid sludge and manure conveyed through, not one or two, but many dwellings, and thrown in a large heap upon the main street, until carted away; the unspeakable stench at the back, inside, and in front of the house may be imagined.

I would say a word about slaughter-houses, and shall describe one. In a minute yard, entirely hemmed in by buildings, whose back windows open upon it, hundreds of sheep and cattle have during many years been slaughtered; no back lane gate exists, the beasts are driven in to their death through the street door. A slight whiff from this fearful den has sufficed to produce in myself severe nausea. This is a fair sample, for all I have seen are very similar.

Water-supply and Means of Ablution.—The source is usually pump wells, and the quality is not prominently bad, but the quantity is often scanty, and always insufficient, for those living far from a pump, hand-carriage being the rule, a cruel labour generally imposed upon the young.

The means of ablution are of the humblest; dirty water is thrown into the kennels, and what with overcrowding and clay floors, extreme personal uncleanness prevails.

On October 2 Mr. Cotton, C.E., read a paper on—

THE OPERATION OF THE PUBLIC HEALTH ACT (IRELAND).

He discussed at considerable length the operations of the Public Health Act (Ireland), 1878, in so far as it related to engineering, confining his remarks to the operation of the Act in respect of sewerage and sewage disposal and water supplies. Upon these points he said:—Since the power of sanctioning loans for sanitary purposes was given to the Local Government Board for Ire-

land, loans for various purposes under this Act have been sanctioned to a large amount. In the nine years ending March 1884, the total amount of such loans was 1,206,419*l*. Of this about 700,000*l*. was sanctioned for waterworks, and 230,000*l*. for sewerage works. Loans to the extent of over 100,000*l*. have been sanctioned for paving streets and flagging footpaths; the balance consists of loans for labourers' and artisans' dwellings, new streets in Dublin, town halls, cemeteries, baths and washhouses, scavenging, &c. Although there has been a great improvement in the water-supply to towns in Ireland generally, there are still cases of important towns which are badly in want of new supplies or considerable improvement of the existing supplies. The sanitary authorities of the smaller towns where deficiencies admittedly exist are frequently discouraged by the fancied, because unknown, extent of the responsibility they may assume, and expenses they may be led into when once they embark on such an enterprise as a 'waterworks scheme.' In the urban towns of the first class, with populations of from 2,000 upwards, the cost of the waterworks is from 2*l*. to 3*l*. and more per head, but does not exceed the annual valuation. In the urban towns of the second class the expense of the waterworks had been, or will be, under 2*l*. for each resident, but exceeds one year's valuation. The rates of interest for sanitary loans from the Board of Public Works vary with the time when the loan is repayable—viz., for a loan of fifty years it is 4½ per cent. per annum; for forty years, 4 per cent.; for thirty years, 3½ per cent.; and for twenty years, 3 per cent. All such loans must be repaid by equal half-yearly instalments of the principal with the proper interest on the then outstanding balance of principal. The annuity system, or that of repayment by equal annual payments over the entire term of the loan to cover repayment of principal and interest, does not now apply to sanitary loans. Loans for waterworks are usually sought for the longest term which the Commissioners of Public Works can give—i.e. fifty years. It does not appear that there is any great advantage in this. The initial rate for a fifty years' loan is only a fraction less than that for a forty years' loan; and in seventeen years, before half or even the shorter term has expired, the rates to be paid for each loan are identical, and from that year out the shorter loan has the advantage of entailing lower annual rates, besides being entirely wiped out in the fortieth year, when there are still ten years remaining encumbered with payments on account of the fifty years' loan. Filtration has not been provided for in all cases. Generally speaking, this has been from the wish to keep down the expenses, but they have only been omitted where there was no decided reason for the water being filtered. Only two loans have been sanctioned for providing filtering arrangements after the completion of the rest of the works, and no other application has been made. The improvement of the sewerage arrangements in towns has attracted perhaps more attention than that of the water-supply, at least since the Local Government Board were first empowered to sanction loans for sanitary purposes, the applications for sewerage loans have been more numerous than those for loans for waterworks. This arises partly from the necessity where it exists from improvements in the drainage of towns coming more readily home to the minds of the ratepayers, and partly because the burden of taxation entailed by such works is usually small compared with the taxation necessary to meet the charges of a waterworks loan. The number of sewerage loans has been swelled by numerous applications during the period of distress in 1880-81, with the object of combining relief through the employment of labourers with utility in the work on which they were to be engaged. The result was that applications flowed in for small loans for sewers in villages and hamlets, which would probably otherwise never have engaged the attention of their respective sanitary authorities. Of course very many of the works executed under such circumstances presented a minimum of utility; indeed, it was not easy to stretch the meaning of the word 'sewers' to include

some of the drains proposed, but every latitude was given, and on the whole I am convinced that a vast amount of good has been effected by the works of this kind, the execution of which was prompted by the desire to afford relief to distressed labourers, and encouraged by the low rate at which the money was lent by the Government. The question of the disposal of the sewage continually presents difficulties in dealing with applications for sewerage loans. There is a widespread opinion that the sewerage of a district should follow the rain water to the nearest stream by which it will be carried off—a very convenient system for the district in question, but inconvenient to its neighbours down stream. The law is now so explicitly stated by the 19th section of the Public Health (Ireland) Act, that sewerage schemes in which this method of disposal of the sewage is adopted cannot be sanctioned and are invariably rejected. The disposal of small quantities of sewage on osier-beds on swampy margins of rivers has been suggested; but this method has not, continued Mr. Cotton, that I am aware of, been adopted in Ireland. I should like to see it get a fair trial here. The larger the town the greater the difficulty of dealing with this question, though when the authority is an urban one it has greater facilities for carrying out anything requiring supervision. Ventilation, in connection with a sewerage system, is now recognised generally as an essential; and no sewerage loan will be sanctioned unless the ventilation of the sewers is provided for. There is a prejudice in many towns against free ventilation in the streets, and recourse is had to ventilation by means of piping carried up the houses, but in the principal towns the ventilators open directly in the street surface. With regard to the effect on the rates of the improvements in sewerage arrangements, I find that in but one or two cases has the initial sewerage rate exceeded sixpence in the pound: it varies from twopence to sixpence. Loans for sewerage works are repayable by instalments and interest, in not more than thirty years. Other loans than those I have been referring to have been sanctioned under the Public Health (Ireland) Act, 1878, to a considerable amount. Over 80,000*l*. has been sanctioned for the construction of new streets in this city, which not only are a direct advantage in facilitating traffic, but also aid indirectly (but largely) in improving the health of the place by clearing unhealthy areas and opening fresh air spaces. Over 130,000*l*. has been lent for paving and flagging streets and footways, by which their state—from a sanitary point of view—has been greatly ameliorated. New cemeteries have in many cases been provided by provisional order for the acquisition of the sites for them, and by loans for the construction of the structural works. Loans have been made, but only to small extent, for disinfecting chambers and baths and washhouses. Perhaps the experience derived from the washhouses now in course of construction in this city may lead to their further development. Loans of some magnitude have been sanctioned for town halls, markets, gasworks, &c., which only slightly bear on sanitary matters. Large loans have also been sanctioned by the Local Government Board under the Artisans and Labourers' Dwellings Act. An Act of Parliament was passed last year which, it is to be hoped, will be attended with very beneficial results to a large number of the labouring class. I refer to the Labourers (Ireland) Act, 1883. It would be premature for me to say more than that provisional orders confirming schemes made by rural sanitary authorities for the erection of over 3,000 houses have been issued by the Local Government Board. The loans which will be required for these will exceed in amount 300,000*l*. Though the works to which I have now briefly alluded as being directly, or indirectly, connected with the operation of the Act of 1878 and its predecessors may not present a large total in the eyes of any one conversant with the long lists of similar works under similar Acts contained in the reports of the Local Government Board in England, I think all

the circumstances surrounding such matters the sensitiveness of the ratepayers' pocket to a further increase in the rates, will agree with me that it has been done, and the successive annual reports of the Local Government Board show that it is conceivable. I hope that our proceedings at this time may attract the attention of those who have the sanitary districts in their charge, and who, from learning what other sanitary authorities have been doing, may be led to look into the state of their districts, and if they find sanitary defects existing, to adopt remedies which they were formerly powerless to do. Now, when they have the power to act, they are empowered to confer on them, avail themselves of the powers afforded, and acquit themselves of the duty they are under to the people in their charge and the community at large.

Mr. R. Rawlinson expressed unbounded confidence for the paper which had just been read, and was proud to be associated, as Engineering Inspector for England, with Mr. Cotton, the Engineering Inspector for Ireland. The address was worthy of all consideration. He held that both Parliament and Government had made a very grievous mistake in the rate of interest for loans for long periods, and the rate of interest up to 4½ and 4¾ per cent., direct taxation on improvements. He held that the first principles of a Government should be to provide for the people at the cheapest possible rate, without the Exchequer to any loss; and he had no doubt about saying that every loan might safely be at 3½ or 3¾ per cent., which would give a great relief to the carrying out of works, and a great relief to ratepayers. When he was sent to Lancashire to cotton famine to advise the Government as to the relief, he had the matter almost entirely in his hands. It was a great experiment, yet not a new one, as they had had a previous experiment in Ireland on a great scale, which did not turn out so satisfactory. It might have done. The Ministry of that day told their minds that it was necessary to give money to the distressed in Lancashire; but they did it with only that half that money, as had been the case in Lancashire would be wasted. At the outset he said to Mr. the Cabinet Minister under whom he was working, 'The works are to be carried out under my recommendation in Lancashire, I undertake to pledge myself that the Cabinet will let us have our way there shall be no farthing of loss; and if I could give such a warranty I would sign a warranty that you might hang me from the first lamp-post if there shall be any loss.' That early two millions sterling, was expended upon sanitary improvements, and everyone admitted that in a sanitary sense Lancashire was made twenty-five years ahead of the rest of the empire. The term had now run out for the repayment of the whole of that loan, but at this moment not one sixpence of the debt had been repaid, but every farthing of it had been honestly distributed. State money on previous occasions had been spent for administration and supervision. The whole supervision of the expenditure had been centred in himself, and the total cost to the State for the administration of that 3½ millions of money amounted to 3s. 6d. per cent. Loans of this sort administered at the lowest possible cost to give the greatest possible benefit; and the State, instead of being made to make any gain by making high interest, it was a very wise thing if it lent the money under guarantees, even at a trifling loss, but there was no loss for that.

Mr. H. Robinson, M.Inst.C.E., read a paper on 'SEWAGE DISPOSAL,' published at page 149.

Mr. Eassie read a paper on 'THE COLLECTION AND DISPOSAL OF HOUSE REFUSE,' published at page 17.

Mr. James Young, Superintendent of Cleansing, Dublin, read a paper on—

PUBLIC CLEANSING.

He informed his hearers that the city of Dublin includes an area of 3,754 acres, and contains a population of 250,557, or 65·8 per acre; the assessable value may be taken at 652,000£., one penny in the pound producing, in round numbers, 2 450£. The cleansing of the city, public and domestic, cost, in 1883, 26,745£., and at present 440 men and 102 horses are employed in the work.

The new premises forming the head-quarters of the cleansing department are centrally situated. The buildings include the superintendent's offices, foremen's dwelling-houses, stabling for sixty horses, storage lofts with steam power for preparing the forage, cart sheds, goods stores, also joiners, cartwrights, smiths, farriers, saddlers and mechanics' workshops, with muster-room and lavatory for the workmen. The amount expended on the purchase of the site, the erection of buildings, and paving work, has been 6,350£.

There are also stations situated respectively in N.W., N.E., S.W., and S.E. districts of the city. At these four stations fifty horses with corresponding plant are kept, but all are managed from Wood Quay, with which they are in telephonic communication.

The cleansing of the city, under one management, is divided into three sections—viz.: (1) the cleansing of the tenement yards; (2) street scavenging; (3) domestic scavenging, or house-refuse and night-soil removal. The city is divided into eight cleansing districts, which apply to all the three sections of scavenging.

1. *The Cleansing of the Tenement Yards and Urinals.*—In this, the last organised section of the work, sixty-nine men, including foremen, are employed. Their working hours are from 6 in the morning till 11, and from 12 noon till 5 P.M. Each man has his own beat, which includes on an average about ninety yards, and each ganger is responsible for all the yards in his district. In this way the 5,000 tenement yards, which are common to a number of families, are swept daily, and, at the same time, the closets are mopped and washed. We also wash with hose some of the filthiest courts and yards which are sufficiently well paved to admit of this highly commendable process.

The habits of the occupiers of tenement houses are a source of difficulty in the cleansing of all large towns; but it is unreasonable to expect people to be cleanly in their habits unless their surroundings are kept in a tolerable state of cleanliness; and, until a tenement yard is properly sewered and paved, it is almost impossible to keep it as clean as it ought to be.

In Dublin, said Mr. Young, I am glad to state that a decided improvement is apparent in the condition of the tenement yards since we undertook the daily cleansing of them. To further improve the habits of the occupiers of these tenement houses, the power vested in the sanitary authority of the Scottish metropolis by the Edinburgh Municipal and Police Act, 1879, and the Edinburgh Municipal and Police Extension Act, 1882, would, in my opinion, be of immense service to us in Dublin. By section 98 of the above Act, 1879, power is given to prosecute the occupier of a tenement house in cases where refuse has been thrown upon the surface of the yard, although the actual offender has not been discovered. In section 41, sub-sections 3 and 5a of the Edinburgh Police Extension Act 1882, there are also excellent regulations regarding the house refuse from tenements, and the regular washing of the stairs of these dwellings.

2. *Street Scavenging and Watering.*—There are in all about 113½ lineal statute miles of streets within the municipal boundary of Dublin. In 1883, 27,000,000 gallons of water were spread on the streets, and 100,748 loads of scavenger were removed, 36,645 from paved streets, lanes, and markets, and 64,103 from the macadamised streets and roads. In this section of the work 224 men, including foremen, and 63 horses are employed. We have ten

horse-drawn sweeping machines in use, with which all the principal streets are swept by night; the back streets and lanes are swept with hand brushes by day. The horse-brushes turn out at eleven o'clock at night, and the day scavengers commence work at 4.30 in the morning, the carts turning out promptly at five o'clock to water or scavenge as required. The asphalted streets are washed regularly with hose; all the first and second-class streets are cleansed daily, and the third and fourth-rate streets are done three times a week. The lanes of Dublin require and receive quite as much attention as the main streets, on account of the quantity of vegetable and other refuse which is thrown upon them. The abatement of this nuisance, however, has of late received considerable attention from the chief commissioner of police.

3. *The Removal of Night Soil and Domestic Refuse.*—This section of the work, commenced in May 1882, is now fully organised, and a staff of 110 men, including foremen and 39 horses are employed. During the present year the quantity of house refuse removed per day has exceeded 250 tons. The cleansing of the ash-pits is done by night—that is between the hours of 10.30 P.M. and 9 A.M., and the men are paid according to the weight of refuse removed. When the domestic scavenging was undertaken there were in the city 18,165 ash-pits, of which number more than one-half were wet sunken pits, and in addition there were 11,577 common privies. From more than 10,000 ash-pits the refuse could be removed through the house only, and from 13,000 ash-pits the refuse had to be carried out in baskets or buckets. The regular and systematic cleansing of these places revealed in full the necessity for structural and other improvements. The abolition of privies in all the main streets was first accomplished, and subsequently a system for the daily removal of the shop sweepings and house refuse therefrom was organised. Galvanised iron dustbins, suitable to the respective requirements of the shopkeepers and householders, are supplied by us at cost price. Three different sizes of covered bins are used for the collection and removal of shop sweepings and dust by the morning bell-carts, and an oblong open bin is supplied for the reception and removal of house refuse. There are already more than 2,000 dustbins in regular use, and the number is rapidly increasing. Having insisted on the use of dustbins of a uniform pattern from the commencement of this branch of our domestic scavenging, Dublin has been spared the nuisance caused by the use of orange boxes, tea chests, hat boxes, and such articles, which are still commonly exposed with house refuse in nearly all large cities.

Thus there are two systems in operation: portable dustbins and fixed ashbins or ash-pits. The former system is extending in the centre of the city, where fixed ash-pits are being gradually abolished. The latter system, however predominates, and the great bulk of the domestic refuse of Dublin is still collected in ash-pits.

During the last two years about 3,000 privies have been abolished, and a corresponding number of water-closets have been erected. There are now about 18,000 water-closets in use, so that in a few years more we hope to see Dublin a water-closeted city.

The removal of excreta by water carriage has its weak points like any other system, still I feel certain that it is the best that could be adopted for Dublin, considering its proximity to the sea, its abundant water supply, and efficient system of main sewers. While the excreta, the most noxious, but at the same time the most valuable of the domestic refuse, is thus got rid of by means which sanitary science considers the cleanest, quickest, and best, the remainder of the house refuse becomes to a large extent valueless as manure, and a large portion of it is altogether unsaleable.

A brief description of the arrangements for the disposal of the city scavenger, saleable and unsaleable, is subjoined.

The total quantity of scavenger removed during the year 1883 was as under:—

Scavenger from Paved Streets, Lanes, and Markets	36,645 loads.
Do. from Macadam Streets and Roads	64,103 „
House Refuse from Ashpits	71,476 „
Do. from Portable Dustbins	2,201 „
Total	174,425 loads

The saleable scavenger or city manure is composed of the scavenger from paved streets, lanes, and markets, the wet ash-pit refuse and night-soil, and amounts in round numbers to 75,000 loads per annum. The unsaleable scavenger, or city refuse, consists of the scavenger from macadamised roads, dry ash-pit refuse, and the contents of dustbins, amounting in all to no less than 100,000 loads yearly. To dispose of the saleable scavenger advantageously, as it is produced, in the least objectionable manner, and to get rid of the unsaleable scavenger by the most rapid, efficient, and economical method possible, a variety of circumstances must be considered.

In Dublin, Mr. Young said, we are confined to the farmers around the city, who draw the manure in large quantities from the depôts, and to those having land convenient to the canals, by which we now despatch a considerable quantity annually. But we have no railway traffic in manure, and on the whole the demand for city manure in the country districts is slow, and the prices obtained for it so very low that it was apparent, from the commencement of the domestic scavenging, that any scheme which would involve the riddling of the refuse, and its preparation as a manure, would not yield a revenue which would justify the expenditure. Besides, in the Dublin refuse the proportion of heat-giving cinder is so very small that it would be inadequate to produce the steam-power required for the riddling and preparation of the manure as carried on in Glasgow and Manchester. I shall now describe briefly the arrangements at one of our manure stations. Stanley Street, which is the only manure depôt on the north side of the Liffey, was purchased in 1882, and extensive buildings have since been erected there by the cleansing committee. On the east side of the ground is the stable yard, with stables for eighteen horses, forage and harness rooms, cart-shed, foremen's offices, and stableman's house. At the entrance gate is the yardman's house and weigh-office, which has telephonic connection with the offices of the department on Wood Quay. From the weigh-bridge a paved inclined roadway, 30 feet in width, provides easy access for the dust-carts to the upper floor of the manure-shed, which covers a space 154 feet in length and 78 feet in width. Within this building the refuse is tipped, mixed, and again despatched by the farmers' carts, which remove in rotation the manure from the three bays into which the ground floor is divided. Cinders and other combustible refuse, valueless as manure, are passed through the cremating furnace, which stands conveniently in a separate building at the end of the manure-shed. Old iron, leather, bottles, &c., are also collected for sale.

In order to prevent the escape of noxious odours, special attention has been given to the ventilation of the main building. The foul air is conveyed under the bars of the cremating furnace, and is thus purified before passing into the chimney, which is 140 feet in height. The yards, incline, and floor of manure-shed are paved with granite sets on a concrete foundation, so that the whole premises present a clean and orderly appearance. To the work as now carried on there has been no complaint, nor is there the slightest cause for objection. The amount expended at Stanley Street on the purchase of the ground, erection of buildings and paving, has been 7,850*l*.

The saleable refuse dealt with at our three manure depôts forms about three-sevenths of the whole scavenger, so that we have about 100,000 loads of unsaleable scavenger to dispose of annually. Regarding this class of refuse, the consideration is what is the cheapest and best

method of getting rid of it at once and for ever? I am glad to state that we have decided to convey the Dublin unsaleable refuse to sea in a hopper barge.

The cost of this vessel will be 5,950*l*. She is specially designed to meet all our requirements, and is now almost ready for launching. A suitable and convenient berth has been obtained on the river near the Swivel Bridge, and is now dredged out to the required depth. A jetty, 120 feet in length, and 16 feet in width, has been there built, and upon it a five-ton steam crane with novel and efficient loading appliances has been erected for the purpose of transferring mud as well as dry refuse direct from the scavenge carts to the barge, with which we propose to commence operations in a few weeks.

The following are the principal dimensions of the vessel :—

	Ft.	In.
Length	116	6
Breadth, moulded	30	0
Depth moulded, amidships.....	12	0
Length of hopper	50	0
Breadth.....	18	0
Sheer, forward.....	2	9
„ aft	1	6
Camber of deck	0	6

She will carry about 340 tons of refuse, and the trip to the place of deposit off Howth and back will take less than five hours in average weather. By this means the refuse will be conveyed to its ultimate destination at an estimated cost of fivepence per ton.

TENEMENT HOUSES.

In nearly all our large cities, Dublin not excepted, the material change caused by the exodus of the better classes to rural or suburban residences has necessitated alterations in the urban houses now occupied by the lower classes, and more especially improvements in the sanitary accommodation provided for them, but in many instances these improvements have not been effected.

The drains, closets, ashbins, water-supply, and paving in the yards connected with the tenement houses forming the dwellings of the working population are frequently defective or inadequate. In every tenement yard there ought to be—1. A proper house-drain not less than 9 inches in diameter, carefully laid with a proper fall to the main sewer, and properly jointed. 2. A large gully-trap connected with the sewer for the reception of slops. 3. Two closets, one for each sex, with a cistern capable of containing not less than four gallons of water. 4. A covered ashbin not less than 5 feet by 4 feet by 2 feet 6 inches. 5. An impervious surface of asphalt, or paving sets grouted with tar, laid with a proper fall to the gully-grate. And 6. In addition to the ordinary water-tap, a tap to which a hose can be attached for washing out the yard should be provided.

With regard to water-closet accommodation, in the absence of compulsory power, it is a difficult matter to induce landlords to go to the expense necessary to provide good substantial closets, with cisterns sufficiently large, and adequate sewers laid as they ought to be; when all these have been provided, it is still more difficult to train a population to use water-closets without abusing them; and it is discouraging to householders to find closets broken or choked with rags or straw soon after erection. Yet withal we regard the water-carriage system as the cleanliest and best that can be adopted in a city circumstanced like Dublin, but at the same time we regard strict supervision over the erection of the closets with their sewers and water connections as an absolute necessity.

A large gully trap conveniently situated in every tenement yard is also requisite, and, unless such is provided, the slops must find their way into the ashbin, as they frequently do.

I have said that we have both fixed ashbins and portable dustbins in use in Dublin, and the latter system is rapidly extending. The daily removal of house refuse by portable dustbins of a uniform pattern is a system admirably adapted

for the removal of shop sweepings and dry house refuse in the main thoroughfares, and it also works well where you have a population living in self-contained houses or cottages, each provided with a water-closet. But from experience in Glasgow and Dublin, I consider it unsuitable for the lower class tenement houses, where in many cases the people have not yet learned to put the slops into the sewer and the solid refuse into the ashbins.

The fixed ashbins now being erected in the tenement yards of Dublin, at the instigation of the sanitary authority, are calculated to contain the house refuse for one week or thereby. The walls are 9-inch brickwork, the roof galvanised corrugated iron or slates, the floor is from 3 to 6 inches over the level of the yard, and the floor and sides are rendered water-tight with cement. Its advantages are (1) a child can throw refuse into it, (2) it is easily cleaned, (3) no filthy water is allowed to escape and permeate the subsoil, and (4) in the event of portable bins being used at a future date, it will form a stand and shed for them.

Necessary as the sewerage and paving of private yards undoubtedly is to domestic cleanliness, the proper formation and drainage of the public streets in like manner must invariably precede efficient street scavenging. I regard a macadamised street, suitable as it may be for light traffic, quite out of place in the centre of a large city, where no amount of attention will keep it entirely free from its usual accompaniments of dust and mud.

PAVING.

A street calculated to sustain heavy traffic should have a good foundation of concrete carefully laid to the required levels. If the surface is formed of granite sets these should be carefully dressed, so that they can be placed close together, and the interstices should be grouted with cement or pitch. Wooden blocks, well laid and grouted, also make a good street surface, less noisy and more pleasant than granite, for a city that can afford to pay for their frequent renewal. The blocks should be carefully selected before creosoting, otherwise they will wear unevenly. Provided with a good surface of granite or wood, street scavenging, though requiring constant attention, is comparatively an easy matter, and can be efficiently accomplished at a moderate cost.

The vegetable supply of Dublin is a matter which also affects the cleansing operations. An excellent supply of fresh vegetables has created a large demand, and they form an important item in the diet of the lower classes. But, unfortunately for the cleansing department, the cabbages and other vegetables are brought into the city wholly untrimmed and consequently in the height of the vegetable season the department is called on to remove per week not less than 200 loads of vegetable refuse.

Dr. MacCabe, L.G.I., read a paper on—

THE WATER-SUPPLY AND DRAINAGE OF SMALL TOWNS IN IRELAND,

in which he dealt in detail with the difficulty of making arrangements for the supply of pure water for the use of the inhabitants of the smaller towns in this country. He also dealt with the difficulty in arranging the sewerage levels, so as to provide against the pollution of the water courses. The great difficulty was the cost and the limited area to which taxation could be applied. He suggested that the cost should be so divided as to fall in equal proportions upon a contributory area. His remarks were confined to small urban populations varying between 500 and 6,000.

Mr. H. Percy Boulnois, M.Inst.C.E., read a paper upon—

ISOLATION & VENTILATION.

(Published at page 144.)

DISCUSSION.

Mr. Dodson said that sewerage ventilation would not be perfect until it was arranged upon the same principle as

coal mines. He did not think that rain-water pipes should be used as ventilators.

Mr. Field thought the proposition was a dangerous one.

Mr. Stirling thought that if the exterior ventilation was interfered with, the noxious gases would be sucked into the houses by the heat of the ranges.

Mr. D. Emptage (Margate) saw no objection to ventilation shafts being laid against the houses.

Mr. J. Wallis Peggs advocated the thorough ventilation of the sewers from end to end.

Dr. Carpenter related an instance which had come under his observation where catarrh had been caused by the emanations from an opening in a sewer.

Sir R. Rawlinson said that he had recommended in his recent directions that sewers should be divided into sections. Traps should be provided to prevent the gases in the lower districts from coming up to the higher ones.

Mr. Boulnois, C.E., spoke of the limited number of inspectors which were provided by the Local Government Board, and expressed the opinion that they were entirely too few to do adequately the work required of them. (See SANITARY RECORD for Sept. 15, p. 108.)

THE OBJECTS AND WORK OF THE DUBLIN LADIES' SANITARY ASSOCIATION.

The writer, a lady whose name did not transpire, remarked that it was now fully acknowledged how important was a healthy condition of life for the happiness of the people. It was one of woman's special works to visit the poor, and there was, perhaps, no cause in which woman's tact and sympathy would be of more value than in instructing the poor in the simpler truths of the 'sanitary science.' There were many things which could be noticed by a lady visitor, as a woman amongst women, which would be passed over by regular sanitary officials, or, if noticed by them, perhaps be objected to as an interference and perfectly unheeded. The sanitary inspector could not enter into the question of personal cleanliness, the proper care, clothing, and feeding of children. It must be very difficult for the people to carry out any cleanliness in the dens in which they live, but they must have the knowledge given them and the belief in its efficiency instilled into them before they would even make the attempt. The hardest part of the work was to persuade the lower classes to try cleanliness. The ladies could also act as 'go betweens' between the tenants of those wretched places and the landlords. In fact, the good that might be done by ladies' sanitary associations if efficiently worked, and worked by those who took a thorough interest in them, was incalculable, but great tact and discretion were required. Lest any ladies should be deterred by fear of any disagreeable opposition from becoming district visitors, it was well it should be known that the people were always glad to see them. There were several similar associations founded, and recently one had been formed in Australia. They were all doing good work. The National Health Society had published a large number of pamphlets, &c., on sanitary subjects, and answered a mass of inquiries; and many of the pamphlets were to be translated into Japanese, Chinese, and modern Greek. The National Health Society has also taken up the questions of seats in shops, early closing, playgrounds for children, bread reform, Matrons' Aid Institute, &c. The Dublin Institute had only made a commencement. It was founded in 1881, and the Countess Spencer, who had on every possible occasion shown her sympathy and given her aid to the society, was now its president. Perhaps the most practical and important portion of the work of the association was the district visiting. Unhappily the districts at present worked numbered only two, owing to the want of visitors, which is the more surprising, as happily in this work 'creed' makes no difference. Protestants and Roman Catholics work together with the approval of clergy on both sides. Surely there must be some women in Dublin who are not tied to houses and children of their own to look after, and

who could undertake the work, and find occupation and pleasure in it. Ladies are more easily found as district visitors for other purposes, and possibly it is a better and easier way than for sanitary work; but if it be remembered that 'cleanliness is next to godliness,' and that, in fact, they must and do go together, some would be found to work in the 'straight and narrow way,' which would lead to other and higher work. In conclusion, the writer said her object had been to bring the subject under public notice, and to ask for workers, and not to write a scientific paper, which would be open to discussion.

Dr. Charles Cameron said that a larger proportion of the population of Dublin, which amounted to 250,000, was in a state of more abject poverty than was to be found in any city in England. You could walk for miles in London without meeting a really bad street or a number of dilapidated houses. But you could not pass out of any of the fashionable squares of Dublin without going through streets in which the people were steeped in wretchedness and poverty. That was general throughout this decaying city. The purlieus of Dublin were worse than those of London. It was therefore nonsensical to compare the communities in the two cities. It was surprising to him that the death-rate in Dublin was only 27 per 1,000, and not about 33 per 1,000; and he was happy to find that, though it exceeded the death-rate of London, it was lower than the death-rates of most great cities on the Continent. He heartily approved of the objects of the Dublin Ladies' Sanitary Association. Few were better qualified than he to express an opinion of their work. He had noticed how frequently they had called the attention of the sanitary authorities to neglected places. He thought the large mortality in this city arose from the insufficient feeding and insufficient clothing of the children. This remark applied not merely to the poor, but also to well-to-do people. He had been surprised to find women of the middle class well and comfortably clothed themselves, while the arms and legs of the children whom they were dragging out for their miserable walks were purple from cold. The Ladies' Sanitary Association had a great work to perform, and he was surprised so few ladies were taking an interest in it. Great as had been the work done up to the present, vast was the amount which still remained to be accomplished. Thirty-three thousand out of the 54,000 families residing in the city were living, on an average, in one and a half rooms per family. He thought the best way to improve Dublin would be to improve two-thirds of the inhabitants off the face of the earth. He took some little credit to himself for having by persistent agitation induced the putting in force of the Artisans' Dwellings Act. They could not expect landlords to provide decent dwellings for people so sunk in poverty that perhaps they could only pay one week's rent in every four weeks. What he had always contended was that it was the duty of the municipal authorities to provide dwellings for the lowest and most wretched stratum of the population. There were 10,000 people in the city requiring house accommodation who could not afford to pay a rent higher than one shilling per week. Plans were now being prepared, he was glad to say, for the erection of houses upon corporate property which would suit people who could not afford more than one shilling per week.

Sir Robert Rawlinson said it had been one of the tasks of his life to investigate what were called charitable endowments in different parts of the country. These charities had increased to an enormous extent. His observations forced him to say—Show me a largely endowed district and I will show you a corrupt population. Where endowments were relied on, they took away the self-interest of the population to look after themselves. Therefore they must be cautious in attempting to do good that they did not make greater evil. 'Under no circumstances can relief be given in money' was an admirable rule of the Dublin Ladies' Sanitary Society. The question of putting the poor into a proper condition was the statesman's work. The laws must be so regulated, and so framed, and so ad-

that there should be relief without Communism, that nation and to that people who ceased to endeavour, and looked to the ranks above clothe, and take care of them. Its disruption me.

Power, Medical Superintendent, Officer of a paper on

PUBLIC HEALTH OF KINGSTOWN.

There was a very low birth-rate and a relatively low death-rate in Kingstown. The death-rate he considered, taking into account the very favourable conditions as to health which ought to obtain in a town so favourably situated. All the physical conditions, namely, the climate, soil, water-supply, and drainage, were good. The first thing that struck him in the causes of the high death-rate was the wretchedness of the slums. These are, for the most part, hidden from view by dwellings of a more respectable character, being, in many cases, erected in what were formerly the yards or gardens belonging to the houses of the middle class, so that all seems prosperous enough to the casual observer. The number of such hovels and the extent of the slums indicates a proletariat out of all proportion to the possibility for employment in such a town. The number of persons in Kingstown constantly on the verge of starvation, he believes, completely abnormal even in the worst years, makes the township extremely sensitive to the effects of 'bad years.' Thus Kingstown presented the worst features of a town of decay, and industry or want were almost hopeless.

Dr. Charles A. Cameron, City Analyst and Officer of Health for Dublin, delivered an address on 'MICRO-ORGANISMS AND ALKALOIDS WHICH ARE POISONOUS.'

Dr. Strype, C.E., read a paper on—

PROCESS FOR TREATING AND PURIFYING BLOOD FOR USE AS MANURE WITHOUT CREATING NUISANCE.

In this manner, the writer said, in which the blood is decomposed, emitting offensive emanations and a strong odour, has presented considerable difficulty in its use. Blood contains about 75 to 80 per cent of water, which has to be evaporated in order to convert it into a convenient form for agricultural or other purposes. The operation of drying, as usually performed, creates the nuisance by the increased emission of offensive odours. The author's attention had been directed to this in connection with the manufacture of sulphate of alumina, and some of the many sanitary purposes to which this material could be advantageously applied. It is generally known that the ordinary hydrated sulphate of alumina had the property of abating the odour arising from the naturally rapid decomposition of organic matter if it had been kept for a short time, but the necessity to do so was considerable, and it was desirable to thoroughly mix the sulphate with the organic matter to secure deodorisation. The treatment with sulphate of alumina has, therefore, not hitherto been a very successful one, much employed on a large scale. Sulphate of alumina, as now manufactured, is itself in water, and especially in hot water; but if the sulphate were previously dissolved in a solution so obtained could be added so as to be incorporated with every part of the blood. He estimated that a small proportion of the hydrated sulphate of alumina, one-fiftieth, or even the one-sixtieth part of the blood, when added in the form of a solution, would be sufficient to entirely destroy the offensive odour, and the resulting mixture could be used to prepare it for use in an open pan or a fire or other means without nuisance; the odour emitted during the process of drying is rather less than otherwise, somewhat resembling that arising from a fresh joint of beef. The most

desirable method of adding the sulphate to the blood is to place in a shallow tin dish of suitable dimensions a small quantity of the solution, containing about three-quarters of a pound of the sulphate of alumina, and allow the blood from the slaughtered animal to flow into it. A full-sized animal gives about forty-five pounds weight, or about four and a half gallons of blood. A collecting-vessel is placed close at hand, and the contents of the dishes are poured into it, when it shortly afterwards coagulates, and not the least trace of offensive odour occurs. This method of treatment is now being carried on upon a working scale by the Dublin and Wicklow Manure Company, who collect all the blood from the animals slaughtered at the public abattoir which the Corporation have recently erected in this city. The blood is conveyed to the company's works at Bailybough Bridge, and there dried in an open pan, without the emission of any offensive odour, or the least inconvenience to the workmen, and without any danger whatever to public health. This treatment has also been carried out upon a large scale at some of the slaughtering establishments (or saladeros, as they are locally called) at Monte Video, in the State of Uruguay, where upwards of 500 animals are slaughtered in each saladero per day on the average during the season.

Mr. Francis Parker read a paper on 'THE INFLUENCE OF FOOD ON HEALTH.'

Dr. Charles A. Cameron read a paper on—

THE WATER SUPPLY TO IRISH TOWNS,

in which he stated that in 1881 there were in Ireland eleven cities and towns governed by corporations or town councils. Their aggregate population amounted to 683,502, and their valuation to 1,743,317 $\frac{1}{2}$. The nine townships surrounding the city of Dublin had a population of 95,400, and a valuation of 395,667 $\frac{1}{2}$. There were ninety-four cities and towns governed by towns' commissioners; their population amounted to 449,451, and their valuation to 286,215 $\frac{1}{2}$. The population of all these was, therefore, in 1881, 1,228,357, and their valuation for rating 2,583,435 $\frac{1}{2}$. In such towns the valuation is about two-thirds of the actual letting value. He had endeavoured to ascertain the nature of the water supplies to these 114 cities, towns, and townships, and had succeeded in ascertaining facts regarding nearly every town of importance in the country. The eleven towns governed by town councils were: Belfast—Population, 207,671; valuation, 568,137 $\frac{1}{2}$; water supplied from a reservoir near Carrickfergus, twelve miles from Belfast. Clonmel—Population, 10,519; valuation, 15,424 $\frac{1}{2}$; supplied by local pumps and wells. Cork—Population, 78,361; valuation, 226,022 $\frac{1}{2}$; supplied from River Lee. Drogheda—Population, 12,516; valuation, 28,121 $\frac{1}{2}$; supplied partly by Waterworks Company, partly by local pumps. Dublin—Population, 249,486; valuation, 657,820 $\frac{1}{2}$. The gathering ground of the water supplied to Dublin consists of granite mountains and other high ground, situated about twenty-three miles from the city, in the county Wicklow. The reservoir is very large, and is capable of supplying thirty-five gallons per diem per unit of the population. At first the water impounded had a faint yellow colour, which gradually became deeper, and after three or four years became so deep as to excite alarm. The colour was caused by the peaty and other organic matter in the reservoir becoming soluble by fermentation. After a time the hue became less intense, and now the water is almost colourless. It is soft; one imperial gallon contains about 4 $\frac{1}{2}$ grains of solid matters, 0.0005 grain of albuminoid ammonia, 0.0008 grain of saline ammonia, faint traces of nitrates and nitrites, and 0.96 grain of chlorine. Its hardness is about 1.8, of which 0.8 is permanent. It is one of the purest waters in the world. With respect to pressure and quantity the citizens have nothing to complain. There are some well waters still used in Dublin. They are generally very hard, owing to the presence of large quantities of earthy salts. Kilkenny—Population, 12,182; valuation, 33,155 $\frac{1}{2}$; supplied by local wells, and to a limited extent from river. Limerick—Population,

38,600; valuation, 65,547*l.*; supplied from River Shannon. Londonderry—Population, 28,947; valuation, 74,595*l.*; no information. Sligo—Population, 10,764; valuation, 18,619*l.*; supplied from a lake. Waterford—Population, 22,401; valuation, 39,866*l.*; supplied from hilly region remote from city. Wexford—Population, 12,055; valuation, 16,011*l.*; supplied from pumps. Statistics of a like character were given of towns under Town Commissioners.

Mr. G. B. Nicholls, C.E., read a paper on—

HOUSE DRAINAGE IN CONNECTION WITH TOWN SEWAGE.

He said he had maintained, and still maintained, that all schemes of sewerage should be designed and constructed to receive the house drainage in the most perfect manner, and that so soon as the sewers are ready to receive the sewage the owners of property should be compelled to carry out a perfect system of house drainage and connections to the sewer upon one principle—such principle to be maintained and supported by the authority and under their entire control; and any deviation therefrom should be subject to the highest penalties the Legislature can enforce. The Local Government Board recommended the advance of capital to carry on these sanitary works, and, in doing so, he was of opinion that they would do well to insist that the house drainage and connections should be made to form part of the whole scheme of sewerage, and hold the authority responsible for this work, which in every instance should be carried out under the supervision of thoroughly qualified officers. If such a state of things could be accomplished under some enactment, we should have our habitations in a healthy condition, and be free from the effects of sewer gas, and the mortality reduced to a state which would not only gladden the hearts of those for whom the work was performed, but the whole community.

Mr. W. Kaye Parry, M.A., C.E., engineer to the Dublin Sanitary Association, read a paper on—

DOMESTIC DRAINAGE IN DUBLIN,

to show that the proper machinery exists in the city to enable the residents to ascertain, for a moderate fee, the sanitary condition of their dwellings, and to afford them disinterested advice and assistance in remedying defects; and, secondly, to suggest some of the practical difficulties which assail the engineer in his endeavour to improve the existing arrangements.

Mr. W. R. Maguire, F.R.M.E. and C.S.I., read a paper on—

PRACTICAL SANITARY LESSONS DERIVED FROM ONE THOUSAND SANITARY INSPECTIONS OF DWELLING HOUSES IN IRELAND.

The paper stated that out of more than one thousand dwelling-houses inspected in Ireland—from noblemen's mansions to six-roomed cottages—only twenty could be certified free from danger to the health of the residents. No selection of these houses was made, they were examined in the order in which they were placed on the books. About fifty of these were tolerably secure though faulty, while twenty only were found free from defect. This, continued the writer, is not a mere statement of opinion, but a record of carefully ascertained facts. Allotting ten persons to each house, we have here over 10,000 persons living under conditions where their lives were continually in needless danger, and where it is known that many from these causes suffered serious illness, in some cases ending fatally. In the brief time at our disposal we must endeavour to deal practically and usefully with one point of paramount importance in house inspection—the house-drain. The opinion has long been held, and is growing steadily, that we are making very serious mistakes in Dublin, decidedly injurious to the health of the citizens and increasing the

death-rate:—1. By using pipes of 9-inch diameter house-drain, laid across under the streets, connecting houses with the public sewers. 2. By laying the soil without cement-concrete foundation, and they are liable to sink. 3. By not imperviousing the joints. 4. By leading them into direct under the scullery instead of invariably them across under the open area. 5. By not the use of approved interceptor traps to exclude sewer air. The 9-inch diameter drain pipes in Dublin are 50 per cent. too large in diameter at their purpose of conveying drainage rapidly into the public sewer. It is very important that the proper size of house-drains should be adopted in a great city. Dublin city, exclusive of suburbs, has more than 25,000 houses in about 130 miles with a population over 250,000. Taking 7 feet, of drain under Section 1 as a fair average for a house, we have 100 miles of drain laid across various ways from houses to sewers under the control of sanitary authority. The length of private house-drains, branches, beside, under, and around houses, extends to hundreds of miles more, but at present we are not in a position to exercise the sole control of this authority. Now, the internal surface area of miles of drain is more or less foul, and is constantly off exhalations to the air in the drain; the present this internal surface area of 9-inch to 6-inch is $2\frac{1}{2}$ to $1\frac{1}{2}$, i.e. the 100 miles of 9-inch drain now our streets and connected with our house 1,188,000 square feet of foul surface area compared with 792,000 square feet, the surface of 6-inch drain, an absolutely unnecessary nearly 400,000 square feet of foul surface area drains. An estimate of items will show the saving in cost to the citizens, if the more suitable diameter drains had been used, would be a capital round numbers of at least 25,000*l.*, and a very saving in money may be effected in future if 6-inch are adopted, besides the saving to life and the importance of forming a hard unyielding foundation drain should never be forgotten. The law or the authority should require all drains to be brought open areas in front of houses, and should forbid drain connection under any vaults having direct access to the houses. That interceptor traps are on the line of drain at some point before they enter the house is held by sanitary engineers, and now admitted. The health of Dublin would be improved if the sanitary authority undertook a systematic examination and test of every house-drain, and their universal reform. There should be an official inspection of the internal fittings of every house. Turning now to Section 2: the private house-drain, solely under the control of the householder; the classes, drains inside the house walls and drains outside the house walls. If it is possible to place drains outside the walls, we are all agreed that they should be, even at all considerable trouble and expense. The extreme importance of sound work in drain fittings, does it not seem the most extreme folly to such work done at low rates? The health of the city depends on the durability as well as on the tightness of each joint and piece of drain. The inspection of a dwelling, when undertaken by a sanitary engineer, should be considered by him as a sacred duty to be carefully and faithfully carried out for the sake of the health and the lives of the future residents.

THE CLOSING MEETING.

At the closing meeting of the Congress, Sir Rawlinson, the President, expressed the thanks of all owed to the able secretaries who had arranged the sections. They had also to thank the Local Sanitary Association of Dublin for the support and countenance persistently extended to them.

Dr. Sykes, Mr. W. R. E. Coles, and Mr. Boulnois, C.E., the secretaries of the three sections, then reported to the meeting what had been done in the sections.

The President announced that the Council had accepted an invitation to meet next year at Leicester. He then moved a hearty vote of thanks to the Provost and Senior Fellows of Trinity College, to the Council of the Royal Dublin Society, the Royal College of Surgeons, the King and Queen's College of Physicians, and to the local Sanitary Association. In no place that they had visited had they received more cordial and hearty assistance than in Dublin.

The motion was passed by acclamation.

Dr. Carpenter proposed a vote of thanks to the Lord Mayor, to which his lordship replied.

Mr. R. O'B. Furlong proposed a similar compliment to the President, who briefly acknowledged it, paying at the same time a tribute to the merits, energy, and ability of Mr. Furlong.

Votes of thanks were also passed to the Presidents and secretaries of sections, and to the Press.

LECTURE BY DR. CARPENTER.

DR. CARPENTER, Chairman of the Council of the Sanitary Institute, delivered a lecture on 'EDUCATION BY PROVERB IN SANITARY WORK,' which is published at p. 135. There was a large audience.

THE BANQUET.

On October 1 the Dublin Committee of the Sanitary Institute of Great Britain entertained his Excellency the Lord-Lieutenant of Ireland and members of the Sanitary Congress and others at a banquet in the Shelbourne Hotel. Sir Robert Rawlinson, President of the Sanitary Institute, presided.

The Lord-Lieutenant, in responding to the toast of his health, said: I will venture to say that no more useful science has been found for the people of the United Kingdom than the hygienic or sanitary science which your association represents so worthily to-night. No one, I think, can have visited that very popular place in London—I mean the Health Exhibition—without seeing how very wide indeed is the range which the net of your society sweeps within its meshes. It is almost impossible to find any subject omitted if you go round that interesting and valuable exhibition. You find food and drinks which are good for health, you find models of houses, of their drainage, their fitting-up; and if you go farther you may see the highest works of art, for mental influences as well as physical influences have to do with health. You may see also not only such matters as those to which I refer, but you may see the extravagances which the vanities of men and women have devised in dress. You may see the sad results of the endeavour to get a very slight waist. You may see the extravagant results of the efforts of men to wear extremely narrow pointed boots. There is nothing in fact which a sanitary exhibition may not embrace within its doors. But I shall not attempt to define your work. I know this, that it has a most useful and beneficial effect on all grades of society, from the richest to the poorest. We all know that in every city there are great difficulties to contend with in regard to sanitary arrangements. London has its Thames, and I think no one will deny that Dublin has its Liffey. Since I have known Dublin, when I first came to reside in this country, nearly fourteen years ago, the question of the Liffey has been a very great one. It is still a great one, and I am afraid it is a very difficult one; but if the Corporation and those who have the charge of the sanitary measures of this city, are enabled—and I hope they may be some day enabled—to carry out this great but difficult work, and that through the exertions which they are making for improving the dwellings of the poor, which are very great in this city, you may hope that if the terrible scourge of cholera comes it may not find many victims among the

poor here. Dublin has some great advantages. It is blessed with fine open spaces—given, some of them, and dedicated to the public by the munificence of some of your citizens—large open spaces close to the very centre of the densest population. You have the Phoenix Park also, which is a splendid place for the recreation and health of the people. In these respects you are very fortunate; and in one most important respect you are probably more fortunate than London and many other large places. I allude to the admirable water-supply which you have. Now, I believe that no greater blessing has been conferred on the people of Dublin than the establishment of the Vartry works and the plentiful supply of that beautiful water to all parts of Dublin. These works are always associated with the name of Sir John Gray.

I believe that in Dublin the Corporation has done a great deal by providing baths, by removing the densely-crowded parts of the city, by encouraging the building of better houses for the poor, through the Artisans' Dwellings Act, and in many other ways they have contributed in a very marked way to the improvement of the sanitary condition of the city of Dublin. In other parts of the country much has also been done. Of course in a country which is much poorer than the sister country you cannot expect that local bodies will take up large operations which cost a great deal of money; but since 1874 and 1878 nearly 1,200,000*l.* has been borrowed and expended by local bodies for the improvement of drainage and water-supply, and in the rural districts last year 50,000*l.* has been expended in various sanitary improvements. I cannot forget one important Act passed last year—the Labourers Act. That Act has already been in operation, but not for long. It has only been in operation for about a year, but sixty-nine provisional orders have been applied for by the Local Government Board, and already the building of over 3,000 houses has been sanctioned under it. When we consider how very bad the houses and cottages of the poor in various parts of Ireland are, I think we may look forward to a very great change in their moral character as well as in their sanitary condition if this Act continues to operate beneficially throughout the country.

The Lord Mayor, in responding, said the Municipal Council of Dublin had very many difficulties to contend against. In reference to the purification of the Liffey, it would be in the recollection of Sir Robert Rawlinson that the Corporation were most anxious to accomplish that work, but they found that the tenders sent in ranged from 500,000*l.* up to nearly a million, and as prudent men the Council did not feel themselves warranted in incurring so large an expenditure, particularly as there were other municipalities which would be equal participators in its benefits, but would bear no portion of its cost. He thought the particular circumstances of Dublin would warrant the Government in taking up this question and passing a Bill to amalgamate the townships with the city. So anxious was the Corporation for the carrying out of the purification of the Liffey they had again taken up the question, and had instructed their chief engineer and chief officer of health to report upon the most satisfactory method for accomplishing it.

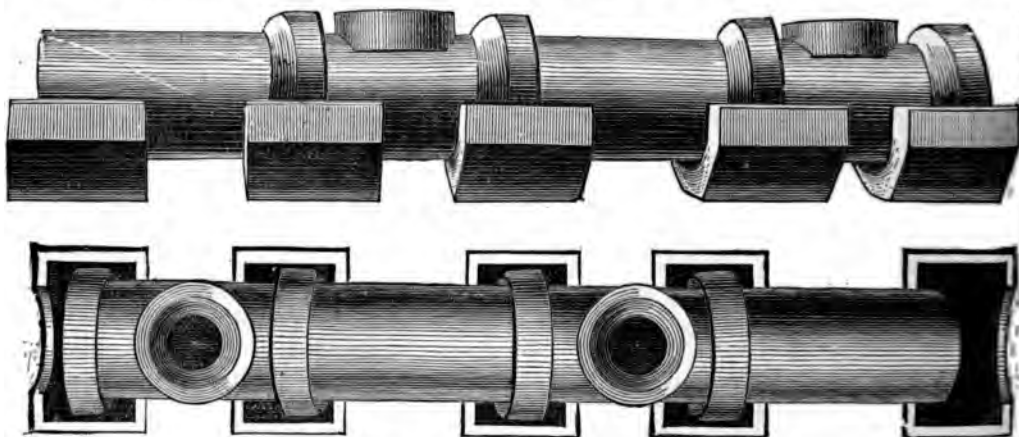
THE EXHIBITION.

For the first time in their annals the Sanitary Institute appear on Irish soil, and Dublin has very properly been selected for its first appearance in the sister kingdom. In no previous year has the Institute been so well accommodated as regards the building in which to hold their display as on the present occasion, for in the premises of the Royal Dublin Society at Ball's Bridge the executive have at their disposal a hall, the counterpart of which could scarcely be met with in any town in the United Kingdom. The only slight drawback is the distance at which it is situate from the centre of the city. The exhibition, however, is of not so comprehensive a character as some of the prior ones have been. There are a certain

number of English firms who 'follow' the Sanitary Institute wherever they go, and the majority of these houses are present. But the Exhibition is interesting as introducing us to a variety of native-made productions in the shape of clothing, &c. Taking the initiative from the great show at South Kensington, the Dublin newspapers have dubbed the display the 'Health' Exhibition, and with the desire that evidently exists amongst the Dublin authorities for the improvement of the hygienic features of their city, the members of the 'fourth' estate are justified in thus changing the usual appellation. That the authorities are taking great interest in the visit of the Sanitary Institute is beyond doubt, and it is to be hoped that circumstances will induce this useful body to cross the Irish Channel again in future years. The Exhibition was formally opened by the Lord Mayor of Dublin on Sept. 30. One 'new departure' on the part of the executive of the Institute is worthy of note, and which, it is stated, is intended to be carried out on future occasions. This is the fact of the principal portion of the awards being made known on the opening day. For a week previous to the opening the gentlemen who were selected as judges were actively engaged in prosecuting their duties, and the announcement of the prizes at this early stage of the proceedings will be gratifying to the successful exhibitors, as well as a guide to the public and intending purchasers. Mr. Box, the Curator of the Institute must have found his task this year a heavier one than usual, seeing that he had been engaged at the 'Healtheries' until within a very short time of the opening, yet everything in his department was as forward as could be desired. Subjoined will be found a description of the principal exhibits. The exhibition will remain open until the 18th inst.

Messrs. Maguire & Son, of 6, 7, & 8, South Frederick Street, and 10 Dawson Street, Dublin, contribute a display which, for completeness, variety, and strict adherence to sanitary principles and true economy, is not approached by any other exhibit or combination of exhibits in the building; nor is it excelled, if equalled, by any single exhibit at the Health Exhibition at South Kensington. But for Mr. R. W. Maguire, the head of the firm, by whose indefatigable energy this collection has assumed such proportions, the Exhibition would certainly not have been so satisfactory as it is, for as a member of the Local Committee he has rendered yeoman's service. In his own exhibit the arrangement of the drains, for various sized houses and buildings, fitted complete with the most approved ventilators, traps, inspection chambers, &c., is worthy of careful attention. Messrs. Maguire have taken out a patent for jointing drain-pipes as shown

ing, a sort of cradle is provided in which the joint rests. This has the effect: 1st. Of holding the pipe and socket concentric, so that a much more perfect and durable cement joint can be made than by any other system, the joint being equally spaced all round, without the use of wood wedges, so often used by drain layers, which wedges rot away in time, leaving a hole under the socket for leakage of sewage. 2nd. It enables the joint to be got at all round, as it holds the pipes steady and even, instead of lying loosely on the ground. 3rd. It enables a second and independent cement-joint to be made on the lower half of the socket where the sewage runs by pouring in liquid cement round the first joint after it has properly set fast, making a perfectly sound, staunch joint, independent of the workman's care and open to the inspection of all concerned. About this portion of the stand and in connection with the above are fitted lavatories, water-closets, &c., complete with cisterns and flushing tanks. They include a variety of designs and qualities to suit the humblest as well as the most expensive requirements, and though differing from one another in some points, are all nevertheless of approved principle. Maguire's Patent Flushing Tank, for the periodical cleansing of drains, calls for especial remark. It is well known that the small amount of water used in closets is not sufficient, or the outlet-pipe from a bath not large enough, to effect a thorough flush of the drains, and it is to obviate these defects that the tank as sketched below is introduced. A glance will at once make clear the action. The rain water or bath water, or both, accumulate in tank until the water overflows into balance cistern and weighs it down, opening the large full-bore valve at bottom of tank and discharging the contents with great force through the drains. The water in balance-tank flows back by means of the syphon into the large tank and closes valve for storage again. It being automatic, no attention or care is required, no waste of water occurs, and no expense incurred beyond first cost of apparatus, and yet the house-drains will be kept perfectly clean and thoroughly flushed every day throughout the year, with water that would otherwise dribble away in small quantities. From these, the fundamental appurtenances of every healthy dwelling, the visitor comes to the kitchen. This compartment is fitted up with a close fire self-setting cooking range, of dimensions suitable for a large family, and the cooking utensils, which are mostly copper, and the other accessories, are of a first class character. The arrangement is very good, the space made the most of, and many hints may be taken from it. Then come divisions arranged respectively as bath-room and drawing and dining-rooms.

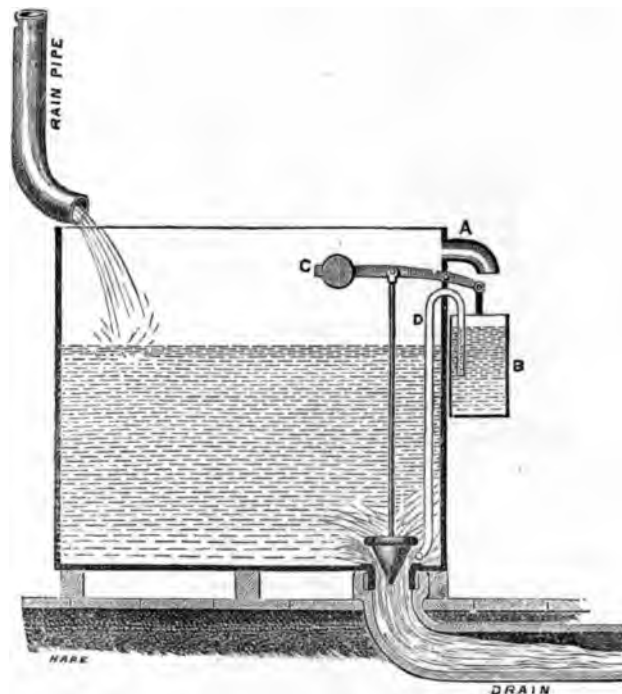


in annexed cut. In this joint it is claimed that by simple means everything that can be desired is secured in a drain at but slight increase of cost. As will be seen from the draw-

The former contains one of the combination douche, spray, shower, and plunge baths, and the fittings usually seen in such an apartment of a well-found establishment.

The other apartments are notable as containing the most recent form of stove-grate, ventilators for ingress of fresh

Mr. Thomas Twyford, Hanley, Staffordshire, the patentee of the now universally used 'National and



and egress of vitiated air, and sanitary washable wall-hangings and non-arsenical wall-papers. They are also fitted complete with furniture and ornaments.

Messrs. Maguire & Son are also manufacturers of Dr. Scott's Self-regulating Hot-air Disinfecting Chambers, which they are showing in another portion of the building. This apparatus is pretty well known, having been awarded the Diploma of Merit at the Medical and Sanitary Exhibition of 1881, since when it has been taken up by the War Department, and by many hospitals and municipal authorities in the United Kingdom and abroad. It is very economical to use, burning but a minimum of fuel, which may be either coal or gas. It is constructed of patented improved composite non-conducting material, with non-conducting door, and contains shelves, galvanised iron safety-carrying case, with wicker linings for clothing, inspection valves, and patent automatic safety-valve to regulate heat to any temperature at will. An apparatus for producing steam for moist heat can also be had with it if desired.

Messrs. Doulton & Co. figure as prominently here as they do at the Healtheries, and though their exhibit is of course on a smaller scale, it is quite as representative, being arranged with the utmost completeness, and at the same time allowing everything to be seen and examined with the greatest facility. All Messrs. Doulton's latest improvements, as shown at South Kensington, and including those recently illustrated and described in detail in the pages of the 'EXHIBITION SUPPLEMENT' of the SANITARY RECORD are exhibited at Dublin; the water-closets, urinals, water-waste preventers, flushing tanks, ventilating syphon traps and similar apparatus being in action. Having so lately commented on the valuable points in these appliances, it is merely necessary to note that all the various articles present their usual merits, and if sanitary reform in Dublin and other parts of Ireland is not speedily brought about it will not be through any fault of Messrs. Doulton & Co. in not showing the simplest and most effective sanitary appliances and means for hygienic conditions.

'Crown' closets, sends specimens of these in various qualities, and also a new design known as the 'Unitas' of which a sketch is appended. Each of them is in action and fitted with a flushing cistern for the purpose of practically demonstrating their several advantages. The salient features of the 'Unitas' are that, unlike other w.c. basins



it is not inclosed in woodwork, nor does it require any wood fittings beyond a movable hinged seat supported on brackets. This arrangement prevents accumulations of dust or offensive matter, and by simply raising the seat transforms it into a slop closet or urinal. The flushing-pipe from cistern is easy of access for inspection, and all other joints and connections being in sight, any leakage or other defect can be easily detected. The outside of the basin and trap is of an ornate and pleasing character. Mr. Twyford is a large manufacturer of lavatory-basins and other sanitary ware, and the collection he has sent of the former stands is pre-eminent for excellence of design and finish. Some are shown fitted in handsome cabinet work with connections for hot and cold water complete, while others are ready for fixing or fitting in frames to suit the purchaser's fancy.

Mr. T. G. Messenger, Park Road, Loughborough, exhibits a Syphon Water-Waste Preventer, constructed on rather different principles to the majority of these appa-

ratus. The distinctive feature is that the flow ceases when the handle is released. No valves are used for the discharge of water, and it is claimed that the result is exactly the same as a cistern constructed on the alternating principle.

Earth-closets are well represented by two good makers, each possessing peculiar points of their own. Mr. R. R. Heap, of Greenheys, Manchester, occupies one stand; the British Sanitary Company, Bothwell Street, Glasgow, another. Our first illustration (fig. 1) is a sectional view of the principle that may be said to be common to all, and

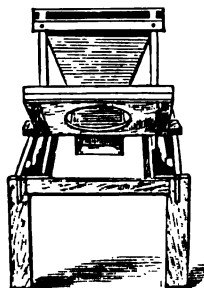


FIG. 1.



FIG. 2.

consists of an earth reservoir for storage, a tank that corresponds to the basin of an old w.c., and the seat, which is so arranged that by sitting upon it it is depressed, but on rising, and in connection with two levers on which it rests, a charge of earth is distributed over the excreta. Mr. Heap manufactures a variety of different forms and qualities, but this, which is known as the seat-action, is the most simple and effective; for, being entirely automatic, no one can use the closet without the distribution of earth taking place.

Our next engraving (fig. 2) shows a very simple form, and only requires the tank to make it complete. It is made of ordinary deal, and can be supplied at a very low price. A portion of the apparatus, only to be seen with Mr. Heap's earth-closets, and recently patented by him, is called a 'separator,' and is calculated to obviate an objection hitherto urged, and in other respects to prove a benefit. This consists of an enamelled trough, fixed in the front part with a grating at bottom, and the urine, instead of passing into the 'collector,' or tank, as it has hitherto done, is by this arrangement diverted, and is carried by means of a pipe into another channel, where it may be collected for after distribution. With this addition the earth-closet becomes one of the most complete *media* possible for the disposal of human excreta, reducing inconvenience to the narrowest limits.

The other illustration appended shows the working of The British Sanitary Company's Patent Self-acting Earth



Closet, which has been described on previous occasions in the SANITARY RECORD. Its chief feature of difference

from others consists in its being fitted with a perforated shovel or scoop D, which by the seat action is brought quickly forward and spreads the earth more uniformly over the excreta than is effected by the ordinary process. It is made in all qualities, specimens of each being shown. Both the above firms have again been awarded the starred certificate of the Institute.

The Hygienic and Sanitary Engineering Company, Charing Cross and Brighton, are showing Bostel's Excelsior Closets in action, notably their No. 3, which contains recent improvements on the original design. These consist of an arrangement whereby a larger quantity of water remains in the basin or receiver, and the flush of water is delivered at the bottom of the basin and not as hitherto on the top, so that the contents are washed away more quickly and more effectually.

Messrs. J. & M. Craig, Kilmarnock, N.B., and the Bourtreehill Company, Dregghorn, Ayrshire, both contribute good assortments of sanitary stoneware, the former consisting chiefly of drain-pipes, traps, &c., and the latter of glazed sinks, washing up troughs, &c.

Antiseptics and Disinfectants are well represented, the most important exhibits being those of Messrs. Jeyes' Sanitary Compounds Company, Cannon Street, E.C.; Mr. Eugène Rimmel; Messrs. Mackey, Mackey, & Co., Fleet, Street, E.C.; Messrs. F. C. Calvert & Co., Manchester; and Mr. J. Wheeler, Ilfracombe. Messrs. Jeyes have sent a very complete and well-arranged collection of their valuable and varied preparations, and have again received the award of the Institute. Mr. J. Wheeler has also received an award for his Pixene, one of the most rational disinfectants that have yet been introduced, and one that is coming extensively into use. His Pixene Soap is also very useful, and, though a thorough antiseptic, may be used without the least detriment to the most tender skin.

Mr. E. Rimmel's Transparent Coal Tar Soap possesses similar qualities, combining the purifying properties of tar with the emollient action of a perfect skin soap. His Aromatic Ozoniser, or Natural Air Purifier, as well as a variety of favourite Toilet Waters, are also exhibited.

Messrs. Burroughs, Wellcome, & Co., Holborn Viaduct, E.C., make a very compact and well-assorted display in the sections devoted to Hospital and Sick-room Appliances, Foods, and Dietetics; their stand being replete with samples of the varied pre-eminent preparations with which their name is so well associated, as well as many recent improvements very interesting to the profession. 'Extractum Pancreatis' is one of their latest introductions, and possessing, as it does, very powerful properties for peptonising milk and other foods for the sick, is well worthy of consideration. The jurors have now awarded to it the prize medal of the Institute.

In cooking apparatus the Wilson Engineering Company, of 227 High Holborn, figure the most prominently. They have in previous years received the starred certificates of the Sanitary Institute; and the fact of their again upon this occasion being awarded the same, testifies to the value of the appliances. The illustration represents one of the ranges in connection with which the company have



introduced a further improvement, that, though not relating to its cooking capabilities, is well worthy of note. With the above sketch before them it is scarcely

to remind readers that the Wilson ranges to the class known as self-setting, and that arrangement of the flues is such that all the heat before the products of combustion pass into the

Nevertheless, a considerable amount of heat its way into the chimney, and it is not expected stove could be constructed to prevent this. The therefore fixes a wrought iron tube in the chimney, of which is bent and passed through the wall in the outside fresh air, which, from the heat in ney, is soon warmed and conveyed through proper to warm the apartments or passages in other the building.

Musgrave & Co., Belfast, and New Bond V., contribute an assortment of their famous Slow ion Stoves. A sketch of one is subjoined, but, a No. 13 of the 'EXHIBITION SUPPLEMENT' their valuable qualities, it will suffice now ion that the latest improvement the firm ade is known as the new Double Chamber

rently attracting as much attention and exciting as much interest in the sister isle as they do in other parts of the United Kingdom.

The articles made by Messrs. Buchan, Kite, and Ellison may be said to deal directly with the subject of ventilation; in contradistinction to those of Messrs. Adams and Leggott, which deal with it more indirectly, though no less efficiently. The former consist of inlets for fresh air to be inserted in the walls of rooms or public buildings, and cowls for fixing on the roof to carry off the vitiated air, while the latter are designed to render the opening of heavy sashes or fanlights a matter of simplicity and ease, and at the same time prevent the possibility of these or our ordinary room windows being interfered with by thieves or others from the outside. They therefore provide a means of keeping up a constant supply of fresh air to apartments, warehouses, &c., with perfect safety, when not occupied.

It will be remembered that the inlet ventilators of Mr. Ellison are constructed on the conical principle, the



mbustion Stove, with patent dust preventer, and main features of it are great heating power, cleanliness, and safety. The arrangement is enious and complete, and provides for a constant n of warmed fresh air in the apartment.

appliances appertaining to ventilation those con- by Mr. W. P. Buchan, Glasgow; Messrs. Kite & alton Street, N.W., Mr. R. Adams, Borough, ndon; Mr. J. Ellison, Leeds; Messrs. W. & R. Bradford, Yorkshire; and Wenham's Patent Gas ompany, 12 Rathbone Place, W., London, are noteworthy.

rst four mentioned are so well known to the of this journal, and to the public generally, own as standard articles, that to detail their e merits is quite unnecessary. It will therefore mention the fact of their being here, and appa-

aperture being smallest at the outside end, and gradually increasing in diameter inwards; the result is that, however strong the wind may be, it will enter the apartment imperceptibly, and without draught. This principle has lately been adapted to tubular ventilators, and are known as Ellison's Patent Expanding Ventilating Tubes, their practical value being very much increased by the low price at which they are offered. This consideration of price in reference to a really efficient apparatus has also brought Stevens' Patent Cowls, also made by Mr. Ellison, prominently forward. Mr. Stevens is able to supply a 10-inch cone ventilator with 4-inch shaft for 13s., and a 24-inch cone with 12-inch shaft and square base for 2l. 18s. 6d.

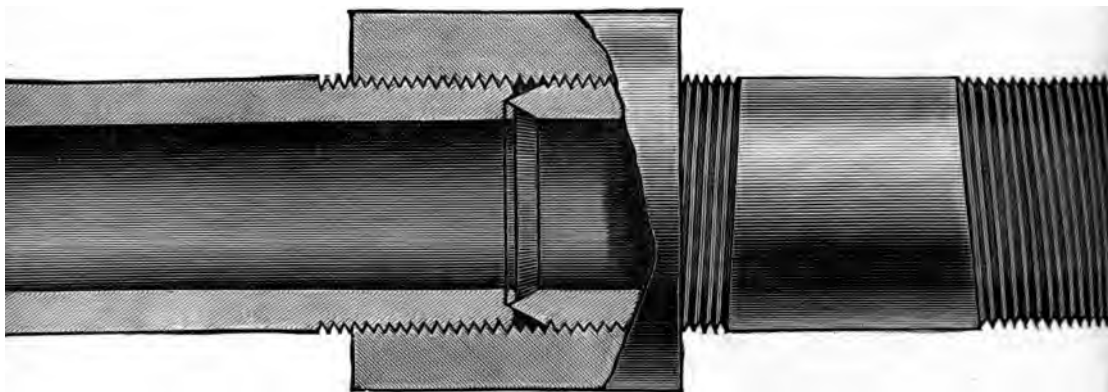
The 'Wenham' Patent Lamp provides light and ventilation at the same time. It burns gas on the regenerative principle, giving a powerful and shadowless light for a minimum consumption of gas. A perforated ceiling plate

communicating with a shaft carries off the vitiated air from the room. An illustration and further details of this invention will be given in another issue.

Messrs. J. L. Bacon & Co., 34 Upper Gloucester Place, exhibit their system of Heating and Ventilating, one of the salient features of which is the peculiar make of pipe used for the hot water coils. It was originally introduced by this firm, and our illustration is a full-sized sketch of it with a joint. In this apparatus the ordinary boiler is replaced by a series of tubes bent in tiers one over the other and disposed in the interior of a furnace, the temperature of which tubes steadily increases throughout their length; a considerable economy of fuel can be secured by careful disposition of the tubes and construction of the furnace; for it is manifest that the temperature of the escaping smoke need only be slightly in excess of that of the return pipes or about 190° F.; whereas in the ordinary boiler where perfectly free circulation is possible,

phenomena of ebullition are avoided, and the heating surfaces can, by regulating the valve accordingly, be raised to very high temperatures without the formation of steam. The system is therefore peculiarly applicable for drying closets and stoves for manufacturing purposes where great heat is required, and where the ordinary system of hot-air flues is inexpedient, both on account of danger from fire and damage from noxious vapours. But since laws of hygiene forbid the employment of overheated metal surfaces for the ordinary purposes of heating, the apparatus is in such cases constructed so that the surfaces cannot exceed a mean temperature of 237° F., with the result, that while in every way obedient to those laws, the greatest possible effect is obtained from the tubes, and one considerably in excess of that obtained from other systems of circulating apparatus.

Messrs. Bacon have special systems of ventilation which are applicable to buildings of various kinds, and they are



and the temperature of the water is practically the same throughout, the heat of the flow pipe governs that of the chimney. The result of this is economy of fuel and rapidity of heating. Amongst the other advantages possessed by this system the following are also worth noting:—

Ease of Application.—In consequence of the superior quality and small diameter of the tubes, and the facility with which they can be bent, the apparatus is equally applicable to old or new constructions, for it can be introduced without disturbance to existing arrangements, and does not necessarily entail the construction of trenches or channels for connection mains, an inconvenience in other systems often debaring their employment. The expenses, therefore, accessory to its introduction are very trifling, and as the circulation does not depend on the tubes being laid at a slope, the apparatus is not unsightly. **Simplicity of Management.**—The action of the apparatus being that of the simple circulation of liquid, induced by lighting the furnace fire, all the difficulties arising from condensation, air stoppage, and the consequent necessity for attention to valves and air-cocks, are avoided. The management is, indeed, so simple that it can be left to the care of any ordinary house servant. **Durability.**—The whole apparatus, when erected, is tested by hydraulic means to a pressure of 130 atmospheres, and since the valve is regulated to blow off at six atmospheres, it is manifest that leaks are of rare occurrence. Further, in consequence of the unusual character of the material employed, viz., wrought iron, breakage is impossible, even in the event of the greatest violence. Hence, the cost of maintenance, often such a heavy item, and so difficult to estimate in the case of other systems, such as steam, cast-iron hot-water pipe, or hot-air apparatus, is in the case of this system practically nil: instances have been known where apparatuses have been in use over fifteen years without entailing the least expense for repair. **Heating Capacity.**—The apparatus working under a valve, the

prepared to make schemes suitable for any building either old or new. In large buildings a fan worked by a gas engine is generally used to extract the vitiated air, the fresh air being warmed before entering the rooms by passing over the hot pipes. This system has been largely adopted on the continent with great success.

Messrs. Chorlton & Dugdale, of Manchester, make a first-rate display with every variety of their 'Excelsior' Spring Mattress, Adjustable Invalid Couches and Chairs. The engraving indicates one of their newest introductions



of the latter articles. A brass rod on the right hand side of the sitter with an endless screw at its lower end working on a cogged wheel of gun metal, enables him to alter the position of the back, without rising from his seat, to any inclination he desires. It also forms a most luxurious reading or smoking chair.

Messrs. Billington Brothers also show their 'Liverpool' Spring Mattress as illustrated in the accompanying sketch. The special features of the appliances manufactured by this firm have been pointed out on other occasions in the

SANITARY RECORD; their present exhibit includes a Hospital Bed, which is very compact and comfort-

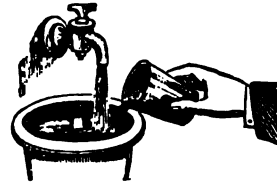


le; and an Invalid's Bed with head-rest, which can be adjusted to the greatest nicety; a Portable Bed and Liverpool Spring Mattress and a simple and inexpensive Adjustable Invalid's Chair.

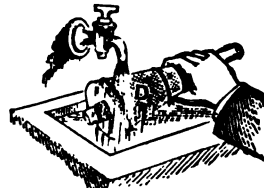
Messrs. Bradford & Co., Crescent Ironworks, Manchester, and High Holborn, W.C., are entered in two classes, viz., Laundry Machinery and Appliances, and for Disinfecting apparatus. The former comprises their well-known Washers, Wringing, and Mangling Machines in a variety of sizes, and a model of a 'Radial' Drying Closet. This is a brick structure built up to dado height, with the lower part of bricks, and above the dado with ordinary brick. On one side is fitted a powerful but economical fan, known as the 'Reversible,' from the fact that the upper and lower halves of it are made in duplicate, so that when, after several years' wear, the upper part is burnt or cracked, it is simply necessary to turn it over the stove to be again for all practical purposes as new. A large number of flat-irons can be heated on the stove; and it gives off into the closet a very high temperature with proper ventilation, which it is claimed will dry the heaviest linen in from fifteen to thirty minutes, the moisture being carried away most effectually by a special ventilating shaft gathered into the main flue. Holding the linen a 'Radial' upright horse is fixed, having some twenty or thirty arms, according to the height of the closet, upon which the linen is placed, the arms upon each arm hanging clear of every other arm.

Mr. Maignen, of Great Tower Street, E.C., is exhibiting his Filtre Rapide, and, judging from the crowd con-

gathering the filter, as represented in the woodcuts, the necessity of securing pure water is fully recognised. It



Setting



Cleansing.

has been pointed out on previous occasions in the SANITARY RECORD and recently in the HEALTH EXHIBITION SUPPLEMENT that a filter to be really useful and to fulfil the purpose for which it is intended, must be periodically cleansed, and the method of cleansing such that any inexperienced person can accomplish with facility. Visitors can see that Maignen's Filtre Rapide meets these requirements to the fullest extent.

Messrs. Robinson & Bamsdale send a case of their 'Strawfena' Cigarettes, the hygienic peculiarities of which have already been pointed out in the SANITARY RECORD.

Messrs. Groom & Co., Liqueurpond Street, E.C., contribute a very commendable assortment of sanitary, domestic labour-saving and improved culinary appliances. They include the Well and Dry Platform Sponge Bath, the Registered Milk Saucepan, the Registered Hot Water Plate, Bacon Dish and Toaster, and Bowers' Patent Potato Steamer. All these have recently been referred to in detail in our report of Messrs. Groom's exhibit at South Kensington in the EXHIBITION SUPPLEMENT; they likewise excite much interest amongst the visitors at Dublin, and the Potato Steamer has characteristically received the award of the Institute.

The stand of Mr. W. Rothwell, 16 Market Street, Bolton, Lancashire, attracts much notice and great approval. Knitting machines in several sizes, constructed on principles only recently perfected by the patentee and exhibitor, and different and superior to any other of their kind in existence, are there to be seen. After careful examination and trial, the jurors have awarded them the Silver Medal of the Institute, and the attention of our readers is drawn to them because they are specially adapted for workhouses, industrial, and other public institutions, to take the place of manual labour, inasmuch as the most inexperienced operator may learn how to use them in three or four days, and in a few weeks become quite expert in knitting hose, mittens, jerseys, and so forth. Machines of a similar character are also being exhibited by other firms, some of which have already been described in these pages.

The Donegal Industrial Committee are exhibiting a case of Hand-knitted Socks and Stockings in silk and wool, and some very beautiful specimens of Embroidery, all the work of the peasants of the north-west coast of Donegal. The former are made up of the most artistic colours, though dyed solely with vegetable dyes, the hygienic properties of which have so satisfied the judges that they have awarded to the Committee a prize medal. Undyed and Vegetable-dyed Homespun Woollen Fabrics, made in the same district, are also shown, and the exhibit generally is exciting a very considerable amount of favourable interest amongst the visitors.



gathering around his stand, and the interest every-
where evinces in the various processes of 'setting' and

The following exhibits of local firms are well worthy of note in relation to the hygienic character of the Exhibition:—

Mr. Wm. Baird, 27 Lower Abbey Street, shows some handsome and well-fitted lavatories and a combination bath, similar to those manufactured by Conolly & Co., recently described in the *SANITARY RECORD*. Mr. Baird also makes a special feature of hydraulic drains, turbine wheels, pumps, &c., and sends some first-rate work of this class. Mr. J. L. Smallman, 23 Temple Lane, has some good syphon cisterns, with arrangements for working them by the ordinary lever and by door action.

Mr. C. Cadle, 39 Wellington Quay, shows hydraulic machinery, including Leffel's Improved Patent Double Turbine Water Wheel. The one shown is 20 inches in diameter, and fitted with wrought-iron buckets and adjustable steel gates. It is suitable either for pumping or ventilating, and on a fall of 20 feet will give 22 horse-power.

Messrs. T. Dockrell, Sons, & Co., of South Great Georges Street, and Mr. William Martin, 18 Stephens Green, North, send admirable collections of artistic decorations, including stained-glass panels, art tiles, and wall-papers. They are of the newest designs, and the latter, being manufactured without the use of arsenical pigments, are thoroughly innocuous.

Messrs. F. R. Scott & Co., 32 & 33 Upper Abbey Street, make a special feature of Solid Oak Parquet Flooring, and for which they have received an award; they also show art furniture of first-rate design and finish.

Messrs. T. Pearson & Co., 11 Ship Street, are manufacturers of Woven Wire Spring Mattresses, which they show in different sizes, fitted complete to bedsteads, so that a fair opinion of their value can be formed.

Mr. Walter Fleming, 47 Dawson Street, also shows a good assortment of bedsteads fitted with spring mattresses.

Mr. John Kehol, 40 South Richmond Street, exhibits a spring mattress stuffed on both sides, so that it can be reversed, and it has perforations to admit a current of air for ventilation.

Mr. Arthur Webb shows Waterproof and Hygienic Boots, &c., and Messrs. F. Smyth & Son and Mr. J. Morgan show respectively, umbrellas, hats, pith helmets, &c., of Irish manufacture.

Mr. F. Leveson G. Gunn, of Rochdale, Rathger, has a wire screen, fitted in front of an aperture, which represents an ashpit through which the dust passes, leaving the cinders in a sort of basket, from whence they are easily gathered to be again utilised for fuel.

The Glen Mills Co., 37 Exchequer Street, contribute to the general interest with specimens of fine flour, wheat, and other meals, all manufactured at their mills; their exhibit also includes the well-known American Breakfast Cereals, the chief British depôt for which is at 44 Great Tower Street, London, E.C.

Mr. F. Tellwright, 47 Grafton Street, shows filters, and Mr. S. Boyd, 46 Mary Street, an assortment of disinfectants, including chlorate of lime, carbolic preparations, &c. The latter has an interesting case containing models of ingredients used in the manufacture of dynamite.

THE AWARDS.

The following is a list of awards made at the Congress of the Sanitary Institute:—

MEDALS AND CERTIFICATES.

*Bradford & Co., London, for washing machines; *British Sanitary Company, Glasgow, for self-acting earth-closets; Burroughs, Wellcome, & Co., London, for powders for peptonising milk; *J. C. Calvert & Co., Manchester, for carbolic acid and its preparations; *Chorlton & Dugdale, Manchester, for Excelsior spring mattress, for 'swing' woven wire mattress; J. & M. Craig, Kilmarnock, for white enamelled fire-clay for sinks; Doulton & Co., London, for art pottery; *Doulton & Co., London, for venti-

lating tile store; *Doulton & Co., London, for anti-percussion high-pressure valves; *J. E. Ellison, Leeds, for conical ventilators; *R. R. Heap, Manchester, for dry earth or ashes closet; Maguire & Son, Dublin, for their exhibit of sanitary and domestic appliances; *P. H. Maignen, London, for filtre rapide; Mackey, Mackey & Co., London, for chemical substances used in disinfection; Musgrave & Co., Belfast, for slow-combustion stoves; Pim Brothers, Dublin, for exhibit of furniture; *J. L. Smallman, Dublin, for Stott's mercury gas governor; Shanks & Co., Glasgow, for syphon action water-waste preventer; *Wilson Engineering Company, London, for their Wilson cooking range; D. J. Wright & Co., Birmingham, for Eureka gas cooking stove, and the silver medal of the Exeter Gas Company.—[A starred certificate signifies that the recipient would have received a medal but for the fact that one had been awarded to them on a previous occasion.]

CERTIFICATES.

Robert Adams, London, for the Norton door spring; same, for adjustable pivot for fanlight; Baird, Thompson, & Co., Dublin, for butler's sink, lined with black tin; same, for white enamelled fire-clay sink; same, for bath, with shower, douche, and spray fittings combined; same, for lavatory, with shampooing apparatus; Thos. Baird & Co., Glasgow, for Watt's asphyxiator for testing drains with smoke; Billington Brothers, Liverpool, for portable bed, with Liverpool spring mattress; Bourtreehill Coal Company, Dreghorn, Ayrshire, for stoneware drain-pipes; same, for white enamelled fire-clay sinks; Burroughs, Wellcome, & Co., London, for absorbent cotton and antiseptic sponges; F. C. Calvert & Co., Manchester, for carbolic soap and for soluble cresole; W. Carson & Sons, Dublin, for Willesden waterproof paper canvas; Chorlton & Dugdale, Manchester, for hospital bed fitted with raising appliances; same, for pitch pine lath mattress; same for hospital bed, with new spring mattress; T. Cordingley & Sons, Bradford, for granite concrete pavement; J. M. Craig, Kilmarnock, for Buchan's disinfecting trap; Doulton & Co., Lambeth, London, for vacuum flushing cistern for closet, with seat action arrangement; same, for cheap glazed stoneware sinks; same, for bath fitting locking apparatus; same, for Lambeth combination water-closet; same, for enamelled ware open channels for manholes; same, for manholes for drains, with connections complete; same, for London-made stoneware pipes; same, for silicon tread for steps; same, for glazed ware mantelpiece, with slow combustion grate; Dublin & Wicklow Manure Company, for alum cake; J. E. Ellison, Leeds, for radiator ventilation; J. W. Elvery & Co., Dublin, for gentlemen's ventilated waterproof overcoats; same, for the Leander lifebelt; W. Fleming, Dublin, for the combination bedstead; Fletcher Brothers, Dublin, for exhibit of tricycles; W. Graham, Dublin, for ventilated hats; Groom & Company, London, for Bower's potato steamer; Jeyes' Sanitary Compound Company, London, for Jeyes' perfect purifier; W. & R. Leggott, Bradford, for opener for fanlights and skylights; Maguire & Son, Dublin, for white enamelled fire-clay sinks; same, for cast-iron drain-pipes coated with Angus Smith's preparation; same, for Marsden tiling for wall decoration; same, for new laundry stove and copper boiler; same, for Scott's self-regulating disinfecting chamber; T. Morgan, Dublin, pith helmet.

CERTIFICATES.

Pennycook, Glasgow, for the system of glazing without putty; Pearson & Co., Dublin, for the institution bed with woven wire mattress; Pim Brothers, Dublin, for the hinged cot; F. R. Scott, & Co., for solid oak parquet flooring; Shanks & Co., Glasgow, for cast-iron bottles, and for porcelain lavatories; Smith, Elder, & Co., London, for sanitary publications; Patrick Short, Dublin, for the rhinoceros hide 'S' boot; Stephenson & Travis, Liverpool, for stygium absorbent antiseptic surgical dressings; T. Hanley, Twyford, for lavatory basins, and for

stop sinks; A. Webb, Dublin, for the 'National' boot for ladies; T. Wheeler, Ilfracombe, for Pixene; W. Wilby, Dublin, for chair belting for machinery; Groom & Co., London, for self-indicating tea or coffee infuser; T. M. Craig, Kilmarnock, for white enamelled bricks; Bourtreehill Coal Company for same; Wright & Co., Birmingham, for ventilating open gas fire; W. Carson & Sons, Dublin, for tortoise slow-combustion stoves; Tyrrell Brooke, Dublin, for exhibit of furs; Scott & Co., Dublin, for exhibit of furniture; Boyd, Dublin, for soaps; same, for chemical substances used in disinfection; T. Twyford, Dublin, India-rubber connection for joining lead and earthenware pipes; Harden, Hill, & Co., Birmingham, for gas cooking-stove lined with white tiles.

DEFERRED EXHIBITS.

William Baird, Dublin, turbine-wheels and hydraulic-ram; Bensdorff & Co., London, soluble Dutch cocoa; Bourtreehill Coal Company, washing-tubs; J. L. Bacon & Co., London, heating apparatus; C. Cadle, Dublin, cotton belting; C. Cadle, Dublin, double turbine water-wheel; C. Cadle, Dublin, Blackman air-propeller; W. Carson & Sons, Dublin, anti-corrosive and other paints; J. M. Craig, Kilmarnock, washing-tub; J. M. Craig, Kilmarnock, Shield's flush-out w.c.; J. M. Craig, Kilmarnock, white enamelled fire-clay laundry-trough; Cantrell & Cochrane, Dublin and Belfast, ginger ale, sparkling Montserrat, and mineral waters; Dublin and Wicklow Manure Company, Dublin, Strype's process for drying blood; F. Dockrell & Sons, Dublin, cheap artistic non-poisonous and washable wall papers; Doulton & Co., London, automatic flushing-tanks; same, waste-preventing valve for water-closets; same, automatic flusher for urinals; same, jointed pipes; same, grease interceptors—since awarded a medal; the Glen Mills Company, Dublin, self-raising flour; Maurice Gandy, London, cotton machine belting; J. Hotblack & Sons, Norwich, the health boot; Holohan & Sons, Dublin, mineral waters; Denny Lane, Cork, Silver-spring rice starch; Maguire & Son, Dublin, safety joint drains; Maguire & Son, Dublin, sanitary reform urinals; Maguire & Son, Dublin, white enamelled fire-clay laundry trough; Maguire & Son, Dublin, white enamelled fire-clay washing tubs; Maguire & Son, Dublin, sanitary reform universal water-closet; M'Dougal & Gunn, Glasgow, Lavage-boon and soaps; P. & A. Maignen, London, process of softening water; Pim Brothers, Dublin, sewing machines; Ross & Co., Belfast, ginger ale, non-alcoholic drinks, and mineral waters; E. Rimmel, London, transparent coal-tar soap; W. Rothwell, Bolton, knitting machines; A. & R. Scott, London and Midlothian, oat flour; Shanks & Co., Dublin, mineral waters; Wenham's Patent Gas Lamps Company, London, regenerative gas-burner; Wilson Engineering Company, London, system of utilising the waste heat from cooking range; T. Edmundson & Co., Dublin, electric lighting; Doulton & Co., London, Maignen's carbon filters.

ANTIMONY IN CLOTHING.—The *Centralblatt für Textil Industrie* records the fact that antimony is to be found in cotton yarn which has been dyed with aniline colours, and remarks that unless great care has been taken in the cleansing of the yarn, it is possible for such a quantity to remain as to be injurious to the skin. Experiments made on different classes of yarn produced results varying according to the nature of the dyeing substance. The samples in which hot water acted as a dissolvent showed only a small proportion of antimony, the highest proportion being found 0.014 per cent. The proportions of antimony which were soluble in muriatic acid varied from 0.036 to 0.31 per cent. of the weight of the yarn. Of course, practically speaking, only the portion soluble in water comes under consideration, but as a pair of long stockings weighs about 2 to 2½ ounces, the antimony would represent an appreciable though minute quantity, the effect of which is a question, it is remarked, for medical experts to decide.

SOCIAL SCIENCE CONGRESS.

At the twenty-eighth meeting, held at Birmingham from the 17th to the 24th ult., the general president was the Right Hon. G. J. Shaw-Lefevre, who delivered the Presidential Address. In the Health Section the president was Dr. Norman Chevers, who delivered the inaugural address, which dealt with the inefficiency of sanitary administration in England, and its probable improvement by the appointment of a Minister of Health.

One of the special questions in this section was—

WHAT ARE THE BEST MEANS, LEGISLATIVE OR OTHER, OF SECURING THOSE IMPROVEMENTS IN THE DWELLINGS OF THE POOR WHICH ARE ESSENTIAL TO THE WELFARE OF THE COMMUNITY?

to which Mr. John Hamer, hon. secretary to the Mansion House Council on the dwellings of the people, furnished the following elaborate reply:—

Among 'other' means he placed in the foremost rank associations of men and women whose object is, by personal visitation of and familiar intercourse with the masses, to arouse such feelings of sympathy, hope, and courage as shall educate the people themselves to a proper degree of independence, love of order, and decency. The condition of thousands of our fellow subjects is what it is because they do not know what it is. Many splendid efforts have been made in this direction. They are grand in themselves, but they are like drops in the ocean. These efforts must be multiplied a thousandfold. The Mansion House Council, appointed Dec. 11, 1883, seek to enforce the laws. They addressed themselves to the formation of local sanitary aid committees. The metropolitan area has been divided into convenient workable districts, and thirty-three committees, of from twelve to twenty members each, have been set to work. Papers setting forth sanitary defects are freely circulated from house to house and complaints invited. No distribution of charity is made. The general duties of local committees are to receive complaints regarding sanitary defects and to deal with them. The Council has been most encouraging, but they are still in want of workers, especially of such as can and will work in the East End and in the southern districts. Several hundreds of ladies and gentlemen have been brought into personal contact with the poor in their daily life. The Council believe that they are in a fair way to be able seriously to grapple with this great social problem. The Council is gradually becoming a means of intercommunication between persons desirous of purchasing bad property, with a view to converting it into habitable dwellings, and owners willing to dispose of the same. Many vestries and other local authorities, but not all, have, through the action of the Council and its local committees, been aroused to a sense of their responsibilities. The rapid growth within the last quarter of a century of the temperance movement in its various forms has worked wonders in the reformation of the habits of the people, and in the restriction of the drink traffic. Still, in the East End recently, house after house was pointed out to Mr. Hamer as taking 50*l.* to 100*l.* a week for beer and spirits from the wage earners whose homes form some of the worst slums in that neighbourhood. The preservation of open spaces for recreation, and the opening of coffee palaces have done great service. The building of better houses for the people, when undertaken and managed on commercial principles, is strongly to be commended—but the results in London have not, so far, been all that could be desired. The houses are provided, but the right class of people are not living in them. The rents are too high for the labouring class. The machinery at present at work for enforcing the laws of sanitation is terribly deficient. For 4,000,000 people, living in 500,000 houses, the wealthy metropolis generously provides fifty medical officers of health, who do not average a couple of inspectors each to assist them.

That is to say, each sanitary official has to look after the

health of 26,000 persons. The Local Government Board issued a circular urging the district authorities to put in force the regulations as to houses let out in lodgings. Out of the thirty-nine governing bodies in London how many have complied with this suggestion? Not half a dozen. The Royal Commission sent out blank forms asking their aid in the collection of statistics vital to the efficiency of their inquiry, and the responses have been practically *nil*. District surveyors when they bring an action against any one for infringing the Building Acts do so at the risk of having to pay the costs of the action out of their own pockets if they fail. Twenty-two thousand persons have been compelled to leave their insanitary homes under the power of the Industrial Dwellings Act. Accommodation has been provided for 14,000 of these. Where, meanwhile, are the 8,000? Nuisances have to be sought out. The power to delay, postpone, and ultimately defeat by sheer procrastination, is one of the worst evils the would-be sanitary reformer has to contend with. The outbreak of infectious disease has to be watched, and the measures taken to prevent its spread. The sanitary authorities exist rather for the removal of nuisances than for the prevention of disease. With regard to disease produced, say, by infected milk, they can do nothing until disease has been produced by its consumption. After a site is covered, houses built, and inhabitants exposed to ill-health or lost their lives, London thinks it well to give to the sanitary authorities power to act. Prevention should be the base of all sanitary regulations. We should adapt our official machinery to our altered circumstances and create a Ministry of Health and Education. The health of the people and the education of the people are so vital to the whole nation that their regulation should be a national, in other words a State, affair.

DISCUSSION.

A prolonged discussion ensued. The operations of the Mansion House Council were almost entirely ignored as being in great measure justified only by the peculiar position of the metropolis, and not called for under municipal administration, which commanded the confidence of the people. The general opinion seemed to be adverse to the erection of dwellings by town councils and local authorities. It was urged that the workmen who traversed London might as well spend the time in going to and from the country, and that to tax the community that a few might live near their work was practically to give a bounty to their employers.

To this the President of the Congress (Mr. Shaw-Lefevre) answered that if it was true, as stated, that in Birmingham the recent inquiry revealed the fact that there were only twelve cases where more than one family dwelt in a room, he could only say that it was a condition of things very different to that of many other large towns. In London there were thousands of such cases, but the case of London, in a sanitary point of view, was more difficult than that of any other town. That was due to many causes. The value of property in the centre of London rendered it almost impossible for workpeople to obtain houses at a cheap rate near their work. There were two kinds of legislation affecting the dwellings of the poor: one, the Torrens Act, which dwelt with individual cases; and the other, Sir R. Cross's Act, which dealt with collections of houses. The Torrens Act could not be improved for the purposes for which it was intended, but both Acts required intelligent local action. If we could get a good authority to carry out these Acts in various localities we should to a great extent solve the difficulty. The Cross Act was more difficult to deal with, and he had himself carried an amending Act in 1882. The original Act enabled local authorities to destroy whole districts of bad houses. In many cases this was the only possible method of dealing with them, but on the condition that we built artisans' dwellings on the sites. The difficulty in such cases was the enormous cost of the land so taken, and he was surprised that the Metropolitan

Board of Works had done so much. Many houses had been removed at a cost of 500*l.* family. The Act of 1882 provided that artisans need only be built upon one-half of leaving the other to be used for commercial. It had been shown by investigation that the people were turned out were not living in the houses they were near their work, but that in many cases had to traverse the metropolis to go to their work, was sometimes in the suburbs. Under those circumstances there did not seem to be any particular necessity for local authority to build the houses on the same land could be procured elsewhere, and perhaps at less work of some, at a cheaper rate. It might be questioned whether the Act might not be further amended in respect, so as to permit freedom of action on the part of the local authority. A serious consideration of compensation to the owner of the premises. The intention of Sir R. Cross's Act that they should be compensated to their full value, and no doubt he thought that that would reduce the cost of the site, but had fallen into the hands of technical men, who were to be very much impressed with the value of land. Conservative ideas of that kind were to be found in the minds of the arbitrators who dealt with the subject. The consequence was that owners obtained compensation amounts which to him appeared preposterous. The question was whether owners who had allowed property to fall into such a bad state and to become a nuisance to the neighbourhood ought to be compensated to the extent in the ordinary manner. The houses bought and sold for letting in tenements, and a lease had only a few years to run the owner made no repairs, thinking it was not worth while, at the end of the lease the site would be taken. Was an owner to be compensated in the ordinary manner or were we to take into consideration that there was a moral obligation on his part to turn out the people who had been living on the premises from time immemorial? If they were taken into account, as he thought they ought to be, compensation to be paid ought to be very much reduced. Then came the question of compensating the middle class. Many of these houses were held by men who took on a lease at a low rent, let them to poor families that way made a large income. The present system of compensation to such men was that the difference between the rent they paid and the income they received was taken and capitalised, and the result was another enormous sum for compensation. Before the Royal Commission he had ventured to contend that such men ought to be compensated on the basis that they were business men; they devoted their whole time to business, and they ought to be compensated in the same way as any other persons whose business premises were taken from them. If such a principle were to be applied it would work out a great difference in the sum of compensation; they might also reduce the cost by the rate of interest charged by the State. It was Sir R. Cross's intention that the State should advance a low interest for the purpose of purchasing the sites. An Act of 1879 raised the rates of interest. It was wise to return to Sir R. Cross's original intention of reducing the rate of interest given assistance to local authorities in that way. The continuance of the present state of things in the worst parts of London was due to the mismanagement of the local authorities by the state of the law, which did not provide methods of preventing owners misusing their property. In that he believed it to be a legitimate object of the State to contribute towards clearing such regions that could be done in no better way than by a money at low rates of interest. These were the changes which the Acts might be amended which enabled local authorities to put them in force. He was strongly in favour of the local authorities building for themselves; and

etter left to private enterprise. Nothing but mischief would result from the local authorities providing houses for the poor. What they had to do was to put a stop to the mischief which already existed.

Professor Gairdner said that the action taken in Glasgow had been largely beneficial. The population which had been displaced was the better for it. He did not see any principle by which the local authority could step in and become landlords without seriously interfering with the law of supply and demand. The principle upon which the work ought to be done was that of upholding the good and condemning the bad, so that if a man built a house he would be certain that if it did not satisfy the authorities it would have to come down. If that rule were made and rigidly adhered to, it would prevent the monstrous evils which had occurred in many great towns.

Mr. Mark Judge, as a director of one of the largest companies, declared that enterprise was checked by the unfair competition of bodies with trust funds not seeking profitable investment, and thus the commercial solution of the question was retarded.

Mr. H. H. Collins said he had successfully advised manufacturers to take their works into the country, and, of course, the workpeople must follow the works. Thus land in towns might be left to realise its commercial value.

THE BRAIN OF THE SCHOOL CHILD.

In a paper bearing this title Dr. Francis Warner drew attention to the nervous, irritable children—children who were irregular in attendance on account of headaches, recurrent chorea, occasional fits; habitual truants, whose brain defect could be proven; the child so dull that it remained among the infants and learnt nothing. Such children were practically not educated. They were not neglected intentionally, but because they were not known to the school managers; they were not classified, and took their chance with the rest. Now, he believed it was possible to discover such children and pick them out by definite physical signs. Such tendencies ought to be detected early, and pointed out to the educationalist, that he may tend such cases carefully, helping to correct the defects due to brain condition.

The special question—

WHAT IS THE BEST METHOD OF DEALING WITH TOWN SEWAGE, THE PRODUCTS OF HOUSES AND STREET SCAVENGING, AND THE PRODUCTS OF COMBUSTION?

was answered by Mr. T. Pritchard with reference to town sewage. He said that the answer to such a question some fifteen to twenty years ago would have been in favour of irrigation: the experience of the last few years had, however, caused a considerable modification of his opinion as to the best method for adoption, varying according to local circumstances and conditions. The writer called attention to the conflicting opinions of chemists regarding the oxidising properties of rivers for the purification of sewage effluent when discharged into running water many times its volume. One eminent chemist asserted that such water, when well oxygenated, was the most effective in rendering into harmless inorganic salts the polluting organic matter contained in sewage effluent, while other eminent authorities asserted, on the contrary, that zymotic diseases were propagated by organic germs in such water, which were practically indestructible. In the interests of sanitation a hope was expressed that the important question should be speedily determined, more especially as when during epidemics the influence possessed by polluted water promoting the spread of disease was considered. He described the works of the Birmingham, Tame, and Rea District Drainage Board, a system which disposed of the sewage from a population of over half a million, and a system for the town of Wednesbury, of which he was the engineer, the method adopted being one of chemical

precipitation and filtration through land, the precipitated sludge being pressed into cake containing 45 per cent. of moisture by compressed air and Johnson's sludge presser, thus rendering it easy of removal without creating nuisance. On the whole, irrigation was the best means of treating town sewage, inasmuch as both complete purification and utilisation of the sewage may be obtained by this method. But no one particular system for the treatment of town sewage could be adopted for universal use, but the local conditions and circumstances connected with each town must be carefully considered, and a method of sewage disposal prepared in accordance therewith.

Mr. Lawson Tait, F.R.C.S., Chairman of the Health Committee of the Birmingham Corporation, read a paper 'ON THE UTILISATION OF TOWN REFUSE,' which will be found at p. 131.

A discussion followed, in which Mr. Baldwin Latham advocated the utilisation of London sewage, which might be effected on the north side of the river, although the south side was unsuitable; and Mr. W. C. Sillar expressed his conviction that sewage matter might be utilised so as at least to avoid loss, even if no profit were made.

In a paper on 'THE BEST METHOD OF DEALING WITH THE PRODUCTS OF COMBUSTION,' Captain Douglas Galton, F.R.S., referred to the efforts made by the Smoke Abatement Society with this object. But it might be accepted as an axiom that it was not by methods for improving the consumption of crude coal that we should ever arrive at freeing the atmosphere from smoke. To do this effectually we must resort to gas. It was nearly thirty years ago that the late Sir W. Siemens endeavoured to introduce into Birmingham gas for heating purposes, both for manufactories and for houses; but the opposition of the then gas company prevented this grand experiment, and it had been in abeyance ever since. Messrs. Minton in their pottery kilns and others had by the use of gas succeeded in abolishing smoke.

Mr. Noel A. Humphreys read a paper on the question—
HOW FAR MAY THE AVERAGE DEATH-RATE OF A POPULATION BE CONSIDERED AN EFFICIENT TEST OF ITS SANITARY CONDITION?

of which the following is an abstract.

In the opening of his paper, Mr. Humphreys urged the public need for some numerical test of sanitary condition, and to the increasing use of the death-rate for this purpose, he refers much of that growth of public interest in health matters which has been the mainspring of recent sanitary progress. In view of this plea for a numerical test, and of the good that has already resulted from the use of the death-rate for this purpose, the inexpediency of its surrender is pointed out, except under one of two conditions; unless its use can be proved to be absolutely mischievous, or unless a better numerical test can be provided in its place. The detractors of death-rates consist in part of those who are only partially acquainted with the true and extreme effect of various disturbing influences of death-rates; while others object to death-rates as tests of sanitary condition because, in the interest of sanitary authorities, they give a limited signification to the term 'sanitary condition.' It is essentially necessary to insist on 'health condition' as the synonym of 'sanitary condition,' instead of limiting its meaning to such variable portion of health condition for which sanitary authorities choose to recognise their responsibility. Death-rates are, in the main, trustworthy numerical tests of 'health condition,' although they may not be of sanitary condition so limited. The various influences which tend to disturb the value of the death-rate as a test of health condition, and which have been urged as fatal objections to the use of death-rates for such a purpose, are examined and analysed in the paper with the view to determine the extreme limit of their effect. It is shown that the only really important disturbing influence, apart from health condition, is the varying sex and age

proportion of different populations, and for this death-rates may easily be corrected. Without such correction, however, the recorded death-rates of nearly all urban populations are somewhat understated, while those of rural populations are overstated. Thus, the excess of mortality due to the unfavourable health conditions of urban residence is greater than it has hitherto been supposed to be. Death-rates may at all times be compared with the mean death-rate in healthy districts, 17 per 1,000; most of the objections made to the comparison of death-rates in different communities may thus be obviated. As the result of his investigations, Mr. Humphreys considers that death-rates afford a numerical test of health condition sufficiently approximate and trustworthy to be useful in the future, as they have been in the past, as a stimulant of the public interest in health progress. While the death-rate at all ages is held to be sufficiently accurate for the above-mentioned purpose, medical officers of health are urged to give in the statistical portion of their sanitary reports the death-rates of persons living at various groups of ages. Such death-rates at groups of ages have a greater scientific value than the death-rate at all ages, although they are not available as numerical tests of health condition, the public utility of which we cannot afford to ignore.

Dr. Henry Ashby read a paper on the question—

HOW FAR MAY THE AVERAGE DEATH-RATE OF A POPULATION BE CONSIDERED AN EFFICIENT TEST OF ITS SANITARY CONDITION; AND BY WHAT MEANS CAN THE HIGH DEATH-RATE OF CHILDREN BE REDUCED?

of which the following is an abstract.

Statistics show that among the working classes of the large manufacturing towns the number of deaths among infants under one year equal one-third, and under five years equal one-half of the total deaths at all ages. The diseases which are most fatal are bronchitis and pneumonia, diarrhoea, whooping-cough, simple atrophy or malnutrition, and measles. The causes of the high mortality are very complex, and include the influence of the health and life conditions of the parents in producing weakly children, insanitary conditions of dwellings, insufficient ventilation of rooms, and effects of smoky atmosphere, improper feeding of young infants, employment of mothers in mills, &c., bad effects of burial clubs, poverty, degradation, and drunkenness of parents. The means to be adopted to reduce the high death-rate are: 1. Improvement in the surroundings and homes of the working classes; provision of open spaces; diminution of smoke; improved dwellings; checks on burial clubs and friendly societies. 2. Improvements in the habits and status of the working classes by means of education, and by extension of ladies' sanitary associations for systematic work among the poor.

DISCUSSION.

In the discussion which ensued Mr. B. Latham said that he believed that the death-rate was largely influenced by and corresponded with the prevalence of underground water, which had the effect of reducing it.

Professor Gairdner was of opinion that the proper death-rate for ascertaining the sanitary condition of any place was that of children under one year of age.

Dr. Herbert Page, Redditch, objected to the entrance of children into burial clubs, and thought that the State ought to veto such a procedure, or defer the payment of the sum assured for several years after the child's death.

Mr. Neison, London, denied that the average death-rate was any criterion of the sanitary condition of a place, and suggested that the mean of the rate of mortality in five groups of ages would give a better idea. He maintained that the sickness in a population did bear a proportion to the number of deaths, and said that a national registration of sickness would be most useful.

Dr. Rickards said he had come to the conclusion that a large portion of the deaths of infants in manufacturing towns was due to the fact that they were insufficiently cared for. The State should prevent mothers going to work in factories until their children were of a certain age, and it should also prevent the entrance of children into death clubs.

The Chairman attributed a large portion of the infant deaths to inexperience on the part of the mother, and thought it would be useful for statistical purposes if the number of deaths of firstborn children could be distinguished from the general rate.

Dr. Ashby, in the course of his reply, said that children were no sooner born than some parents or their friends began to think of providing for the burial of the infants, and they were insured in a club or clubs, sometimes for as much as 10*s.* or 12*s.*

Mr. Neison said this was against the law, which prohibited the insurance of the life of a child under ten for more than 6*s.*

Dr. Ashby said he believed the law was evaded, and the possibility of evading it and obtaining more money than a funeral would cost, led to neglect of the ailments of infants.

The President (Dr. Chevers) said one remedy might be to prevent any club money coming into the hands of parents for other purposes than those of the funeral and legitimate expenses connected therewith.

Dr. Herbert Page, S.Sc.Camb., of Redditch, read a paper on—

THE SANITARY TEST-VALUE OF THE 'MEAN MORTALITY,' WITH SUGGESTED MEANS FOR REDUCTION OF CHILD MORTALITY,

of which the following is an abstract.

He pointed out that first and most important of those varying conditions which modify the test and impose limitations which must not be overlooked in gauging its true value is the element of time, the relative value of a mean depending on the length of the series of years or groups of events observed, its value increasing as the square of the time. At least, a decennium should be taken, especially in small populations, and those where numerous other variants affect the result. In the terse language of Dr. Guy, 'averages are numerical expressions of probabilities; extreme values are expressions of possibilities.' The degree of approximation to the truth should, with regard to the probabilities, be estimated by Poisson's rule, and with respect to the probabilities, by ascertaining the error of mean square, or simpler, by the method of successive means. The effect of the birth-rate, the nature of the sex and age, grouping of the living, compared with the standard of the 'English Life Tables,' and the local life table, the effect of selected lives, of public institutions, emigration, and immigration, and especially the 'expectation of life' of the community, must be regarded. The value of the variants being assessed, the trustworthiness of the mean mortality will be in proportion to the balancing of the extremes, deduced from a sufficient series of observations, and having special regard to the relative sex and age groups of the living to those of the dying; in the same groups, in the same or similar populations. Reverting to the causes and remedies for the high child mortality, the author enumerated the delegation of the care of infants and children to others whilst the mothers were engaged at work, coupled with improper feeding. He suggested that the Infant Life Protection Act should be raised from being a dead letter and enforced by the sanitary authorities; that every person taking charge of an infant or child for pecuniary or other reward or consideration should be required to register her name and address with the local sanitary authority and the registrar, and should be compelled to comply with specific regulations as to character, cubic space (regulating the number of children to be allowed, bed accommodation, washing and laundry appliances, and general sanitary regulations as to light, ventilation, drain-

supply, and systematic inspection; also the establishment at the local expense of a sufficient properly appointed crèches. With reference to the employment of women after childbirth, it is suggested that it should not be allowed within the limits of childbirth, and that the employers of a wife should be required to deduct a certain amount from their weekly wages to be invested with the wife on the wife's behalf, to be refunded during her absence from work; the registration of births, and the delivery by the registrar of a simple instruction in the care and feeding of the child, and the more or less continuous presence of zymotic and epidemic diseases being important causes of child life, considering we had advanced, even in law, so far as to admit their preventability, it is useful to civilisation that the provision of hospital accommodation was not compulsory, and that the local authority should not register the presence of these cases at all, fully as we do those occurring amongst cattle. The effects of the common insanitary defects of old dwellings, he was aware of the difficulty of the position of the subject, but thought it must be enacted that no person or community shall be allowed to possess any dwelling contravening the principles of healthiness. Another most important thing—if it does not distinctly bear against—the prevalent custom of insuring the lives of children, by which parents (sometimes others) acquire a pecuniary interest in the death of the child. Even such a possibility is inhuman, and unequal. Either no insurance should be permitted under five years of age; or, if permitted, any sum therefrom should not be payable until a year after death, long enough to destroy all interest therein. Again, we urgently require an improved, and simplified method of medico-legal inquiry into the causes of the deaths of children. First, the agency of medical officers of health be required to secure their official independence and tenure so that they might well be required ex-officio to act as coroners, or assessors to, if not as coroners. An inquest should be held in every case where the cause of death is not certified by a registered practitioner, or, failing this, in cases where the cause was ill-defined or doubtful. He would make, at least, the principles of diseases justifiable 'causes' to investigate, and the authorities should be held pecuniarily responsible in a manner regulated by law for omissions or mistakes connected therewith. Lastly, there was the principal cause at the very root of much child mortality which he was afraid we were not yet prepared seriously to consider—viz., some check on the transmission of an enfeebled child from various causes, alike a misfortune to the child, and further endangering succeeding generations, antagonising the highest beneficial and hygienic, viz., to raise the expectation of the community, thereby securing to it and to the greatest good of the greatest number, and growth more perfect, decay less rapid, life more durable, and health more remote. Our waste of child life, and the national and legal-hygienic blot, calls for the consideration of some such measures as here he was saving of life which can be undoubtedly and speedily justify the legislative adoption and some such principles.

Henry Urlin read a paper on—

TRACTION FROM PUBLIC USE OF SPACES AND WAYSIDE STRIPS OF

He said that in the last century open spaces were everywhere; and the traveller on horseback was not limited to the stony road—he used

the wayside strip of green. The open spaces have now mostly disappeared. Inclosure Acts have converted the larger of them into private property—a process in which (formerly, if not at present) the claims of the poor were little regarded. Many other wayside strips have been inclosed and built on; and in some localities at least the most miserable of the cottages—those destitute of gardens—are found built on these strips. In many other cases the neighbouring owner has quietly enlarged his field by taking in the strip between it and the road. The latter becomes in consequence nothing but a hard and dusty causeway, so many feet in width; and the poor have lost much which might make their lives more tolerable. So far as these spaces are built over the injury is beyond remedy. Where there has been no actual building Parliament might well interfere in two ways—(1) by prohibiting any inclosure of the wayside strips to the extent of 10 feet or 12 feet on either side of the statutory highway; (2) by enabling the local authority to reclaim and recover back from those who have abstracted them from public use the strips fenced in during the last twenty or thirty years. It is not necessary to touch the question of property. Half of the highway now belongs to the adjoining proprietor; but he owns it *sub modo*, and, having once dedicated any way to the public, the latter have the full enjoyment. By an extension of this doctrine of public dedication to open spaces and wayside strips which the public enjoyed thirty years since and have now been deprived of, this growing public mischief may be stopped, and the amenities of life in the rural districts much increased. The 'local authority' must not be the vestry, as over them, either as landlord or as employer, the abstractor of spaces probably has in all places much influence. It should be a more extensive and independent body, such as the Highway or Poor Law Board of the district, until a County Government Bill is passed; and in case of dispute the County Court judge should have full power to adjudicate.

In the Art Section Mr. T. C. Horsfall contributed a voluntary paper on the question—

ARE LOCAL GOVERNING BODIES JUSTIFIED IN EXPENDING LARGE SUMS OF PUBLIC MONEY FOR THE PURPOSE OF BEAUTIFYING TOWNS AND OF PROVIDING PARKS, PLAYGROUNDS, AND OTHER FACILITIES FOR PUBLIC RECREATION, AND, IF SO, WHAT ARE THE LINES ON WHICH THEY CAN MOST ADVANTAGEOUSLY WORK?

The writer took it for granted that everyone believed it to be the duty of the community to provide for each class those things which it could not provide for itself, and could not lack without great injury to the whole community. He held, therefore, that if he showed that through the failure of local authorities to make towns beautiful, and to provide facilities for recreation for the working classes, grave injury had been caused to the whole country, the question he had to discuss must be answered affirmatively. Pointing out that many children in towns did not know how to play, and that a great many ratepayers, having never learnt to care for beauty, either of nature or art, would be opposed to the provision of art galleries, parks, &c., at the cost of the rates, he argued that the help of school managers was needed to teach all townspeople to take wholesome exercise and enjoy beautiful things, and urged that all children should be taught at school how to play games and use gymnastic apparatus. He then recommended that town councils should make existing playgrounds in towns, including those of all schools, out of school hours, of more use by providing them with gymnastic apparatus and well-trained custodians; that covered gymnasia, like one which has been at work successfully in Manchester for the last two years, should be provided for use in dark evenings and wet weather. He said that

town councils ought to provide large towns with an almost complete ring round the towns of open spaces, partly consisting of parks, partly of play-fields; but that there was no chance of work so costly being done, as many ratepayers could hardly afford to pay their present rates, unless the inhabitants of large towns acquired the power of including the suburban districts, the inhabitants of which got most advantage from new parks, within the municipal boundary, without the consent of the inhabitants of the suburbs, and unless the owners of land in towns were made to contribute to the municipal revenues.

THE PRESERVATION OF OPEN SPACES.

Mr. Robert Hunter, M.A., formerly honorary solicitor to the Commons Preservation Society, contributed a suggestion for the better preservation of open spaces. He reviewed the progress of public opinion and of legislation on the subject of open spaces. The principles established—(1) that common land should be preserved in its open condition; and (2) that no opportunity should be lost of providing public gardens in towns. But notwithstanding the strength of public opinion, open spaces were not yet safe, but were liable to be inclosed by the Land Commission, or appropriated for purposes of railways and other industrial undertakings, or inclosed by the lord of the manor. The Commons Preservation Society and other existing agencies were able to cope with the first two of these dangers, but there were no trustworthy means of resisting the third. The remedy which he proposed for these defects in the existing machinery was the formation of a corporate company under the Joint Stock Companies Acts for the purpose of acquiring properties possessing common rights, manors and commons, and town gardens, and of managing all open spaces so acquired in the public interest. In addition to these such an association might ultimately be enabled to arrange without purchase for the temporary use by the public of town gardens, to co-operate with local authorities for the above purposes, to exercise, for the protection of open spaces, rights of common attached to properties purchased, and subject to the foregoing considerations, to manage property for profit. But the central idea was that of a land company which should administer its property with a view to the protection of the public interests in open spaces.

Mr. Vesey Fitzgerald thought it would be very unjust to put a special tax on the owners of property in order to promote the objects advocated in the paper.

Mr. Shaw-Lefevre said that there was no man in the country who knew more about commons than Mr. Hunter. He had been employed in nearly all the great commons cases, and was the solicitor to the Corporation of London in the Epping Forest case, in which between 6,000 and 7,000 acres had been saved for the benefit of the people. Fifteen or sixteen years ago such a task would have been deemed hopeless, but with the assistance of Mr. Fawcett, Sir Charles Dilke, and others, great victories had been won. At all events, we were now safe from legislative interference. By the common law the lord of the manor could not enclose a common except by the consent of each and every commoner. In Epping Forest one lord of the manor had enclosed about 1,200 acres, thinking he had obtained the consent of all his commoners. But the Corporation of London had common rights in respect of a cemetery of about twenty acres, and fought a costly battle for the rights of commoners in which they were victorious. Suits for rights of commons were very costly, and although a few public-spirited individuals had vindicated the rights of the people, the work of commons preservation could only be carried on by associated effort. He was disposed, therefore, to welcome the suggestion of Mr. Hunter. He should be disposed to go so far as to require the sanction of Parliament to every scheme of inclosure on the part of a lord of the manor, though he was afraid that however willing the House of Commons would be to agree to such a proposal, it might not be so acceptable in another place. But what was now wanted was not so much large spaces

as a number of small ones for play and recreation grounds. Twenty or thirty commons averaging 160 acres each had been rescued about London. He would also suggest that corporations ought to have the power, which the Corporation of London had recently exercised, of acquiring more land than was needed for the purpose of a park or recreation ground, in order to dispose of the superfluous land at its improved value. By a recent Act of Parliament (*see* SANITARY RECORD for September 15, p. 86), disused burial grounds could no longer be built over, which was a great boon to the crowded parts of towns.

Mr. Sturge advocated the repeal of the Mortmain Acts for the purposes referred to in Mr. Hunter's paper.

Mr. F. Safford urged the Commons Preservation Society to take up the question of footpaths.

THE OUTBREAK OF TYPHOID FEVER AT KIDDERMINSTER.

THE town of Kidderminster, a parliamentary and municipal borough, with a population of some 28,000, situate on the banks of the River Stour, and known throughout the civilised world for its carpet manufactures and other similar industries, has, during the last six weeks, been the scene of one of the most serious and extensive epidemics of typhoid, or enteric fever, ever known in the Midlands. As in most cases of the kind, when once the gravity of the attack became known, a tendency was at once manifested to exaggerate the evil, and to let dismay and terror run riot with reason and common sense. The wildest rumours got afloat both as to the causes and the extent of the outbreak, and remedies were proposed during the earlier period of alarm which were not of the most practicable nature, would have involved the town in ruinous expenditure, and probably have effected no good. Typhoid, enteric, or pythogenic fever, as this particular form of disease is variously named is one of the preventable class of diseases, and generally arises from the inhalation of foul air or sewer-gas, the drinking of impure water or contaminated milk, and is essentially a consequence of sanitary neglect. Anything approaching an epidemic of this particular disorder cannot consequently occur without throwing grave responsibility upon the local authorities, and pointing to some great sanitary defect or neglect. Now that the excitement and apprehension which followed upon the public knowledge of the magnitude of an evil, the source of which could not be satisfactorily ascertained, has calmed down, and people have the opportunity of forming conclusions based upon the investigations of competent and scientific authorities, the causes of the epidemic and the remedies most likely to be efficacious are more clearly discernible. It was at the monthly meeting of the Town Council, held on Sept. 3, that Mr. D. Corbet, the Medical Officer of Health, in a supplementary report, stated that since his monthly report had been made up, a sudden outbreak of typhoid fever had appeared in the town, not confined to one district, but prevailing generally. From 80 to 100 cases had broken out, fresh cases were occurring every day, and there had already been seven or eight deaths. He was not prepared then to state the origin of the outbreak, but was inclined to put it down to sewer-gas, and he recommended that the sewers be constantly and freely flushed, that disinfectants should be used both about the sewers and in the watercarts, that the sanitary inspector visit every case of typhoid to see the conditions under which it occurred and that the proper sanitary measures were used, that the water-supply be tested by analysis, and that the infectious diseases hospital be opened free to all but pauper cases. On the 11th he reported that fresh cases continued to arise, that the conditions of the outbreak were such as to place its source outside milk contamination, that the water had been analysed with a satisfactory result, and that he was of opinion the cause arose from want of sufficient ventilation for the sewers, forcing gas into the houses and

adjoining premises when the sewers were flushed, owing to the immense quantity of water discharged into them, and the defective manner in which many of the drains were trapped. Up to that date there had been 200 cases reported and 14 deaths registered. On September 22 he reported a death-rate for the month of 40·784 per 1,000, as compared with 29·058 for the previous month, and 13·765 for the corresponding month last year. Of the total deaths there had been 18 from diarrhoea, as compared with 19 the previous month, and 27 from typhoid. At the monthly meeting of the Council, held on October 1, he reported that the total number of cases reported up to that time was considerably above 600, and that the total number of deaths was 44. Since then the deaths have increased to nearly sixty. Such a condition of things in a town like Kidderminster, occupying a low-lying position and covering a comparatively small area, was naturally calculated to create alarm. This feeling, however, was much intensified by special articles which appeared in the *Birmingham Daily Post*, in which an attempt was made to trace the source of the outbreak to a contaminated water-supply, the onus of such contamination being laid upon the sanitary authorities themselves. One of these articles was accompanied by a diagram showing how the water-supply, according to the theory set up, was polluted. Kidderminster, like too many other towns in this part of the country, is largely dependent upon the filthy midden system, and a large number of these are uncovered, and are admittedly in a very insanitary condition. But a number of the better class houses are provided with water-closets, which, it has transpired, are directly connected with the town sewers. For the treatment of the sewage that passes through the sewers, a sewage farm has been put into operation. This is situate on the Stourport Road, and the sewage is pumped to the requisite level from works situate within seventy feet of the well from which the town is mainly supplied with water. The pipe conveying the sewage from the pumping-house to the sewage farm passes close alongside this well, and at a joint in this pipe, fifteen feet distant from the well, a slight leakage or 'sweating' was alleged to be going on, sufficient to cause a dampness of the surrounding soil. The inference drawn was, naturally enough, that the leakings from this faulty joint in the sewage conduit percolated into the well from which the water supply of the town was principally obtained. Such a suggestion of course produced considerable uneasiness in the minds of the townsfolk, inasmuch that if this was really the cause of the outbreak of fever, there was no knowing to what extent the seeds of the disorder had been sown. Nor was this all. At a distance of about ten feet from the well was a disused collecting tank for sewage, in which there was stated to be between three and four feet depth of foul stagnant water, of a dull greenish tint, the soakage of the adjacent soil, showing the pervious nature of the ground, and the ease with which percolation from the leaky joint to the well might take place. It has also been stated that the site where the sewage works now are was formerly a brick-yard, and that the pits which had been dug for clay were afterwards used as 'tips' for night soil and rubbish. Obviously the first duty imposed upon the authorities under these circumstances was at once to ascertain whether such percolation really did take place, and, if so, to what extent; also to thoroughly test the quality of the water by analysis. This they lost no time in doing, and an analysis of the water was made by Mr. Jones, the borough analyst for Wolverhampton, as follows: 'Grains per imperial gallon, or parts per 70,000. Total solid matter, dried at 212° F., 14·080; free or saline ammonia, 0·000; organic ammonia, 0·0010; nitrogen as nitrates and nitrites, 0·1485; chlorine, 1·470; oxygen, absorbed in four hours at 80° F., 0·0010; colour through two feet a very pale greenish tinge; total hardness, 11°·16. The analysis shows your water to be in a perfectly satisfactory condition.' Mr. Comber, C.E., the

borough surveyor, in a report dated Sept. 9, demurred to the statements that the outbreak was caused either by sewer gas or pollution of the water supply; but made a sweeping indictment against the middens. 'There is no doubt,' he stated, 'that the present partial system of middens is a fruitful source of disease. The excreta from fever patients is in many cases thrown into them without any previous disinfection, and perhaps a whole row of houses are common to one midden. When emptied, the liquid contents saturate the yard where thrown out. The street and channels, and frequently the gully grates, receive some of it. It is then carted through the town, with the risk of some of it being spilled and sowing infection broadcast. I consider the whole of these disgusting places should be swept away, and proper water-closets and dry ashpits substituted. Until this is done the health of the town will not be satisfactory.' However much we may be disposed to agree with these remarks, which recommend themselves, the report left the cause of the outbreak an open question, for the midden system could scarcely be held responsible for the almost simultaneous appearance of the disease in all parts of the town, and the rapidity with which it spread. The Mayor (Mr. D. W. Goodwin) then telegraphed to the Local Government Board to send down an inspector to investigate the matter, and on September 22 Dr. Parsons visited the town, and, in company with the Mayor, the surveyor, and other officials, inspected the well, the sewage pumping works, and the section of the pipe containing the joint from which the 'sweating' was alleged to proceed. He also examined the apparatus used for flushing the sewers, and held a conference with the medical men of the town. As the result of this visit the Town Council received a letter from the Local Government Board on the 26th ult., which stated that Dr. Parsons had reported to them the result of his visit to the town, that they learnt that the situation of the well at the sewage works rendered it liable to the risk of very serious pollution, and noted with satisfaction that the Council proposed to sink a second bore, in addition to prolonging the suction-pipe 50 feet, and to fill in the space between the pipe and the side of the bore-hole with concrete. They could, however, only regard that as a temporary measure, and were of opinion that the source of supply should be discontinued as soon as practicable. They also hoped the sanitary authority would take active measures for efficiently dealing with all sanitary defects which might be discovered during the inquiries it was proposed to make as to the sanitary surroundings of each house in which a case of enteric fever has occurred or may occur. So far as this communication goes, indefinite though it is, the only department upon which suspicion is thrown, by inference, is the water-supply from the well near the sewage pumping works. Formerly the water-supply of the town was pumped from a well sunk into the new red sandstone, about a mile and a quarter out of Kidderminster, on the Stourport Road, the works there being opened in 1872. But the supply proved inadequate, and the surveyor was instructed to prepare an estimate and scheme for a new bore-hole at the sewage works, as an auxiliary supply. This was done; and tenders for carrying out the work were ordered to be obtained at a meeting of the council at which twenty out of the twenty-four members were present. The water obtained from this well was analysed from time to time, and reported to be equal to that which had been obtained from the artesian well at the water-works, the analysis in September 1880 being that it was 'an exceedingly good water, well suited for drinking and general domestic purposes.' This source would seem to have gradually come to be that from which the town is principally supplied, the well being pumped night and day, while the old well is only pumped eleven hours out of the twenty-four. With regard to their sewerage arrangements the authorities cannot be charged with idleness. In ten or twelve years they have expended 120,000*l.* in their endeavours to secure an efficient water-supply and drainage

system, and they certainly seem in this instance, as soon as they recognised the gravity of the position, to have taken such steps as would enable them to grapple with the difficult and onerous task so suddenly thrust upon them. At the meeting of the council held on the 1st inst., while deprecating the sensational reports and statements which had been made, and which, while doing no good, caused unnecessary and dangerous alarm, the serious nature of the case was fully admitted, as well as the necessity for such prompt and effectual measures as would stamp out the present attack and prevent a recurrence of it. The Mayor does not seem to have known previously of the situation and surroundings of the well at the sewage works; but as soon as the possibility of sewage getting into the well was mooted, the pumping was stopped and recourse was had to other sources for the water-supply. At this meeting a lengthy report was submitted by Mr. E. Pritchard, M.I.C.E., F.G.S., the well-known authority on sewage matters, in conjunction with the borough surveyor, upon the general sanitary arrangements and water-supply of the town. The report attributes the cause of the outbreak to sewer-gas or polluted water, or both, condemns the middens and slaughter-houses, some of the latter of which drained directly into the sewer, and states:—

‘Our inspection of the sewerage arrangements, both as regards the construction of sewers and house-drains, prove them to be most defective, and in their present condition positively dangerous to the health of the public, some of the sewers being laid with a reverse fall, allowing the organic matters therein contained to decompose and evolve deleterious gases, when frequently the only method of escape for such gases would appear to be directly into the dwellings, there being no ventilation of either sewers or house-drains; at least, more correctly speaking, ventilation is the exception and not the rule, although water-closets have been generally adopted in the higher parts.

‘Our inspection of the slaughter-houses and back-yards shows the existence of a most offensive and disgusting state of things, the condition of many of these places being sufficient in themselves to create sickness.

‘Before offering our conclusions and recommendations as to what is absolutely necessary to be done, it is desirable that due consideration be given to the nature of the sewage discharged from the various manufactories and other places into the sewers. The sewage in itself is of a very offensive description, but is greatly intensified by the discharge of nearly all the liquid refuse at a high temperature from the mills constantly during the day. This has the effect of rarefying the gas given off by the sewage, and renders absolutely necessary a more comprehensive system of sewer ventilation than what is required in other towns not similarly conditioned, whilst many manholes to the sewers are provided with a catchpit, or sump, thus allowing solid matter to be arrested and deposited, which, if not constantly removed by mechanical means, adds to the nuisance.

‘Under these circumstances we would therefore recommend that immediate attention be given to the following suggestions, which, in our opinion, when considering the health of the public, are absolutely essential to be at once carried out.

‘1. That no further supply of water to the town be taken from the supplemental well in New Road, at the Caldwell pumping-station, until structural alterations have been effected, and that by means of iron pipes carefully inserted into the bore-holes, with proper connections direct from the suction-pipes of the pumps, and the whole of the well surrounding such bore-hole carefully filled with cement concrete, and then pumping only, as a temporary measure, direct from the bore-hole, instead of, as formerly, from the well, at the same time frequently determining by analyses the purity of the water so taken.

‘2. In consequence of the water-supply to Kidderminster being at certain times insufficient, that another well and bore be constructed, together with the necessary pumping power, at a point to be hereafter determined.

‘3. That the high level reservoir be cleansed and covered with masonry or concrete, as in its present condition it is unsuited for storing water pumped from the deep sandstone formation; also that a high level service reservoir be constructed.

‘4. That the supply of water be constant, and that no direct connections between the distributing pipes and water-closets be permitted; also that arrangements be so made, with existing flushing cisterns, so as to effectually preclude the possibility of access of sewer-gas to the water pipes.

‘5. That immediate ventilation be given to the sewers by means of open gratings at the surfaces of the streets, or roadways, one hundred yards apart, such gratings to be constructed to prevent the admission of detritus to the sewer. By the construction of these ventilators air will be admitted to the sewers, which is as great a necessity in underground ventilation as the openings are for the exit of air, thus forming a series of upcast and downcast shafts, and where the sewers are properly constructed, and regularly flushed, the diluted sewer air, discharged at the ground, will be rapidly diffused and deodorised by the atmosphere.

‘6. That the sewer in Park Lane, having at the present time a reverse fall, be relaid in a proper manner, as well as such other sewers in the town as may be found to have an insufficient inclination.

‘7. That the catchpits or sumps at the bottom of man-holes be filled in the semicircular earthenware, or brick inverts, level with the outgoing sewer, be constructed.

‘8. The disconnection of house-drains with sewers where practicable, and the ventilation of all soil pipes and traps of water-closets. Such house-drains to have between the house and the sewer, a trap and downcast shaft combined, as also a gully trap and grating, and so arranged that there shall be no connection between the ordinary slop-stone and the house-drain.

‘9. In consequence of the natural tendency of sewer-gas to rise to the higher points of the town, the sewer system to be ventilated in sections, by the construction of flaps upon sewer outlets in manholes, so that no one particular district shall ventilate the sewers of another district.

‘10. That surface-water, where practicable, be diverted by the existing gullies and surface-drains to the river, and so reduce the difficulty of dealing with the sewage and lessen the annual cost at the outfall; also that manufacturing refuse, so far as possible, be prevented from entering into the sewers.

‘11. The construction of additional self-acting flushing chambers, where the flow of sewage is sluggish, consequent upon the flat gradient of sewers.

‘12. That the present system of middens, which is both insanitary and dangerous to health, be at once substituted by proper self-acting trough-closets, and that all receptacles for ashes and other refuse be constructed above the ground level and covered.

‘13. That the keeping of pigs in the thickly populated portions of the borough be prohibited.

‘14. That a public abattoir be constructed, and all private slaughtering of cattle and pigs be prohibited; also that immediate closing of some of the more objectionable ones take place.

‘15. A great number of small houses, from their want of drainage, bad state of repair, and other unsanitary conditions, are little less than hotbeds of disease, and should be immediately declared totally unfit for human habitation, and closed accordingly. No doubt such suggestion, if acted upon, would inflict a serious hardship upon the owners, and is such an exceptional case as may be fairly considered by the Town Council.

The report was adopted, and measures are to be taken to put the recommendations in force at a probable expense of more than 10,000*l*. It is satisfactory to know that the epidemic is on the decline.

The views the medical men of the town take of the

subject will be gathered from the following resolutions, passed at a meeting at which there were present Dr. Roden (in the chair), Mr. S. Stretton, Dr. Langford, Messrs. David Corbet, J. W. Colbourn, J. Lionel Stretton, and Dr. Measures. A prolonged discussion took place, and there was a minute investigation of all circumstances bearing upon the causes of the epidemic. The following resolutions were unanimously agreed to:— (1) 'That, while we are unable to state positively the cause of the epidemic, we are of opinion that it was primarily caused by the water-supply, and that it has been aggravated by the imperfect drainage system and other insanitary conditions, and that there is no evidence against the supply of milk.' (2) 'That from the evidence produced we are of opinion that the well at the sewage station should be immediately closed, and not used again under any circumstances whatever.' (3) 'That proper provision should be made for the certainty of pure water in the reservoir, including the raising of the surrounding wall and the adoption of a proper covering.' (4) 'That immediate steps be taken to provide an additional supply of pure water at a distance from the town.' (5) 'That the drainage system be fully investigated by an eminent sanitary expert, all levels, catchpits, and ventilation to receive his especial attention.' (6) 'That all junctions with the main sewers be examined and certified as being in rigid order, by the Corporation officials.' (7) 'That a public abattoir be constructed without delay, and that all intramural slaughter-houses be abolished.' (8) 'That all middens and privies be abolished, and that no pigsties be allowed in the close confines of the borough, and that some measures be taken to mitigate the emanations from obnoxious trades.' (9) 'That, in the meantime, the free use of disinfectants should be proceeded with, including the flushing of all drains and watering of streets with the same.' (10) 'That the Infectious Hospital be placed at the disposal of the medical profession for the admission of all such cases as they consider desirable, and that such admissions be obtainable with the greatest possible ease.' (11) 'That a thousand handbills be printed for distribution amongst the fever cases, with suggestions for the care of the patients' nursing, disinfection of secretions and linen, proper feeding, and dealing with milk and the water.' (12) 'That a fund should be started for the provision of nurses, to devote their time to visiting the sick poor under the guidance of the medical profession.'

Since the above was written a requisition has been presented to the Mayor asking him to call a town's meeting at an early date to consider the present serious state of the drainage and water-supply of the town. Considerable inconvenience has been experienced by reason of the stoppage of the water-supply from the well at the sewage works, the supply from other sources having run short on several occasions. Though fresh cases still occur, they are of a mild nature.

THE MEDICAL AND PHARMACEUTICAL EXHIBITION AT HUMPHREYS' HALL, KNIGHTSBRIDGE.

THIS Exhibition was opened on Monday, and will remain open until Nov. 12. It is under the patronage of the authorities of University College Hospital, to whom the surplus will be given after the expenses are paid. Writing at the moment of going to press, the reporter can give only a mere outline of the exhibits. Many of the leading manufacturing chemists and surgical instrument-makers are present, as well as makers of apparatus for inhaling nitrous and oxygen gases. Good preparations are also fairly represented. Medical glass and aerated water-bottles, mineral waters, lime juice, &c., find allocation, and many articles of domestic use bearing upon health are amongst the exhibits. But the principal feature, and one to which the attention of the medical profession will be drawn is a Portable Iron Hospital, erected by Mr. Hum-

phreys under the supervision of the authorities of University Hospital and furnished by them, nurses being in daily attendance to explain the various appliances, &c. As this hospital will be described in detail in our next issue, with illustrations, it is only needful now to note that it is a most complete building, and shows how corrugated iron can be made to do duty for hospital purposes, either for temporary or permanent uses. There are two wards, each large enough for six beds; with kitchen, scullery, bath rooms, and w.c.'s, matron's room and sleeping room, and everything is built up in the most substantial manner, though easily taken to pieces for re-erection. Since the National Health Society held their exhibition at Humphreys' Hall in June 1883, the fine pile of buildings then in course of erection by Mr. Humphreys is nearly completed, and the principal hall is enlarged. The public are admitted free of charge to this exhibition from 10 A.M. until 1 P.M., after which, until 8 P.M., the charge for admission will be one shilling.

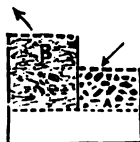
NEW INVENTIONS.

ARTIFICIAL GRANITE PAVING.

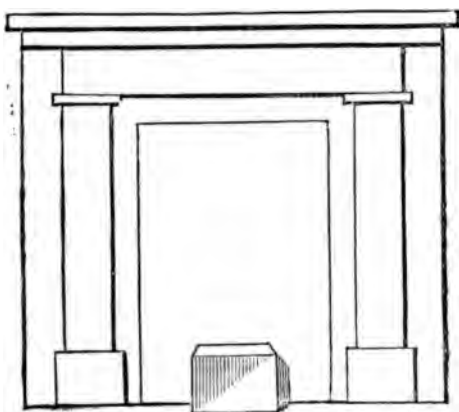
WITH the different kinds of artificial stone coming more or less into use for paving, it appears somewhat singular that a system of laying more after the style of the ordinary 'flags' has not been generally carried out. With one or two exceptions all that have come under the notice of the writer have been set in one continuous length as asphalt, or in blocks of such size that they could not be taken up without breaking. This adds to the expense very much, besides keeping the work of relaying about longer than necessary to the great detriment of street traffic and shopkeepers. In the case of asphalt this has become a great nuisance, as it must be remembered that there are gas-pipes, and in many instances water-pipes leading to every house, these being bedded in and not to be got out except by breaking up the pathway again. This difficulty belongs to any artificial substance laid in the manner mentioned. The writer recently paid a visit to Ealing to inspect some artificial granite paving that has been laid for five years, and the principle adopted appeared to him to be an admirable one, while the cost of the pavement is less than asphalt, or any artificial substance save tar-paving, which is not likely to be used except for suburban traffic. It is much less than that of York flags, to which it bears a close resemblance. This paving, which is laid by Mr. Taylor, of Church Street, Chelsea, is chiefly composed of the small chippings of granite received direct from the quarries. It is laid on the spot in blocks about two inches thick and about the size of ordinary flag-stones. Wherever a pipe occurs that may necessitate the paving to be removed at times, provision is made for this at each side of the block, so that when one is raised the others can be removed with ease; for it is one of the advantages of Mr. Taylor's arrangement that each of these blocks can be taken up without breakage, as a solid flag-stone. It is unnecessary to dilate upon the merits of such an arrangement, as its economy and simplicity must be apparent. Looking to the wearing qualities of granitic pavement there is none other save asphalt that is so enduring, and the feeling of safety to the pedestrian, offered by the artificial granite, is superior to all others. It is, the writer is informed, some eighteen years since Mr. Taylor introduced this substance, which he has laid extensively in the brick form as a flooring for stables, &c., with great success. It is therefore difficult to understand the indifference shown in reference to Mr. Taylor's invention by vestries and similar authorities, since it is calculated to provide a better and more economical pavement than can be obtained in a large majority of our towns.

VENTILATION BY SYPHONIC ACTION.

MR. C. MAITLAND TATE, a civil engineer of much experience, has invented a new form of ventilation, which consists of a syphon ventilator that may be portable or form a part of a complete system of ventilation for the whole of a house as an extractor, and an air filter also on syphonic principles, as an inlet for fresh air. This system Mr. Tate has aptly named 'Aids to health and comfort.' Taking the air inlet for description first, there is a deodoriser, and an air purifier contained in a small box, of which an illustration is appended, and through which all air entering the apartment through its agency must pass. This box, it will be seen, consists of two compartments, A and B, and



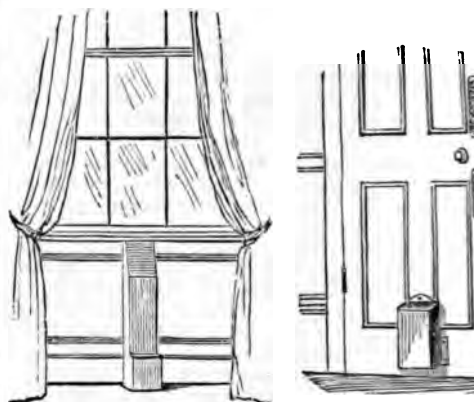
a passage underneath. To whatever this box is attached, compartment A is outside and B inside. A is filled with small lumps of charcoal, and B with layers of cotton wool placed loosely in it. Although not a syphon as we generally understand—viz., a bent tube—the action is undoubtedly syphonic, as the air entering at A has to pass down through the charcoal, where it is deodorised, through a perforated bottom into the passage, whence it rises upwards and is filtered through the agency of the cotton wool in B, entering the apartment perfectly clean and pure. If any doubt should exist as to the truth of this, the sceptic has only to examine samples of cotton wool that have been in use a week or two, when his misgivings will be quickly set at rest. The top of the compartment B is also covered with a perforated lid. The utility of this process will be acknowledged by persons looking at our next illustration, which shows a fireplace with a board fitted to it, to which is attached the purifying box or



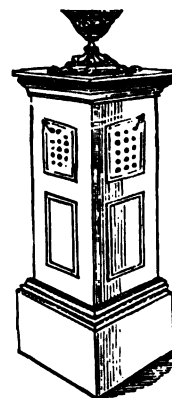
filter at the bottom. The advantages of fresh pure air in a bedroom cannot be over-estimated, and in the case of invalids it is still more valuable. The cost of this portion of the invention is comparatively insignificant. The effect of this apparatus is to purify the air that enters the room, so that however impure the air may be in any locality, persons using this invention are sure to be supplied with wholesome air to breathe at all times, and owing to the minute subdivision of the air, by means of the perforated lid of the filter, without any perceptible draught.

As in an ordinary syphon, when the long or delivery leg is lengthened, the flow increases in velocity; so in the air filter, the more air that is consumed in a room the greater does the supply become, hence the supply always equals the demand. The same mode may be carried out by means of the door of a room, by filtering

the air coming in from the hall or landing, or fixing a tube just under the window, as shown in accompanying illustrations. Another mode by which



invention can be utilised is by means of a pedestal shown in the next illustration, where the air is brought from the outer atmosphere to the bottom of the pedestal, passed through the same purifying medium, and is ad-



to the room through perforations in the four upper panels, the top being left free for a vase of flowers or other ornament. The extractor for the foul air is at about 6 feet from the floor, and can be made of any variety of ornamental designs. From the opening is carried down a certain distance, finishing in an upward bend or syphon, which may be carried to the chimney in any suitable mode of exit. There are two ways of effecting this. To use technical terms, either a long leg, or a short leg is required; that is to say, if the tube can be of sufficient length, the natural action is alone sufficient for the purpose; but, if this cannot be obtained, a slight amount of heat, even a candle or small lamp, to produce an upward current is necessary, and without going into detail can be arranged in a variety of simple ways. Mr. Tate also provides an entire portable apparatus, that can be easily carried by any person and removed from the room for the purpose of ventilating it and purifying the air in connection with the fireplace, which must prove of great value, particularly in the case of sudden illness, or when a room has not been used for some time. In addition to the unerring action of the syphon, there are palpable advantages in the sectional application of Mr. Tate's invention. This system has been successfully applied to the ventilation of broughams and other close carriages, and is equally applicable to large passenger vessels, either steam or sailing, and to yachts or other pleasure boats. The different applications of the system can be seen at No. 10 Kensington

Town Road. Both the ventilator and filter can be made of any suitable material and rendered ornamental as pieces of furniture.

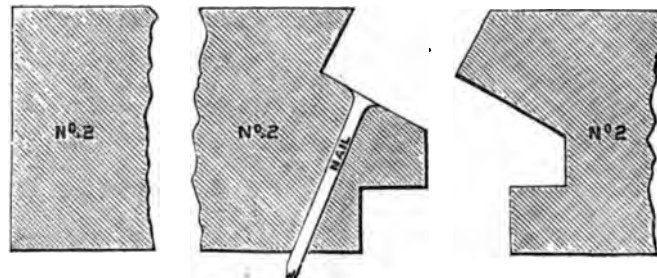
NAIL-LESS WOOD FLOORING.

AMONGST the changes partaking of a sanitary character that are gradually finding their way into our homes, the supplanting of the time-honoured 'Brussels' or 'velvet-pile' carpets, covering the entire floor, by square Turkish or Indian carpets and rugs partially covering the floor is not the least notable. But this change is not pleasing to the eye where the old flooring boards, even when stained to imitate oak or other woods, are left down with their gaping interstices. To obviate this objection, Mr. Samuel Putney, of the Baltic Wharf, Harrow Road, has introduced an excellent flooring, which, when laid down, presents a perfectly smooth and close surface, as even and close as a parquet floor, and at a moderate cost in excess of deal flooring. Though called a nail-less floor, it is not so in the strict sense of the term, as the illustration shows, but the advantage is that what few nails may be necessary (and they are very few) are out of sight, and it will be seen by the engraving, which is a sectional one, how the one board

recommendation. As an inexpensive and durable fancy flooring Mr. Putney's invention deserves public patronage. It has been laid down in the new building of Madame Tussaud & Sons in the Marylebone Road, which will prove a good test as to the points of advantage commented on.

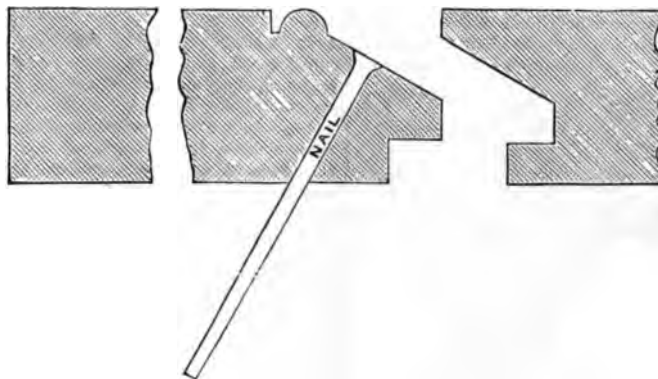
THE CRAPE OF HEALTH UNDER-CLOTHING.

FOR some few years past under-clothing bearing the above title has been manufactured by Herren Straehl & Co., of Zofingen, Switzerland, which possesses commendable features, and is now being introduced into the United Kingdom. The garments, which consist of the usual kinds for men, women, and children, are made of pure silk, silk and wool, and all wool, in different strengths for various climates and seasons. The peculiarity of the clothing is in the modes adopted in the weaving, which, as its name suggests, partakes of a crape-like character, and is composed of a series of slightly raised ribs, presenting a more extensive space for evaporation, owing to the porosity of the web, than is offered by the ordinary mode of weaving. It is therefore calculated to absorb the perspiration more quickly, and its curly texture, though not in the slightest degree irritating to the most sen-



covers the other, hides the nails, and presents a perfectly close surface. In addition to the flooring, another section is prepared by Mr. Putney for wainscoting or dados, of which is also presented an illustration. So far as the flooring

sitive skin, tends to keep up a gentle friction, calculated to promote its healthy action. This clothing possesses a peculiar elasticity, which, while causing it to adhere to the body, is of so mild a character as scarcely to be per-



is concerned, besides the advantages already recapitulated, there are others not less considerable. It must be palpable that accumulations cannot form, and from the solidity (thicker boards being required) exhalations from lower floors are kept back. The designs of the nail-less flooring are necessarily limited, and unless 'broken up' in certain parts are confined to what may be termed 'ribbon' patterns, or longitudinal strips of different coloured boards. Apart from its ordinary uses, it offers advantages as a flooring for temporary ball or other rooms; the ease with which the boards are laid down and taken up, coupled with their effective appearance, being a strong

ceptible in wear. The garments are supplied of the natural colour; consequently danger from poisonous dyes is avoided. Although, as a rule, all-wool garments are to be recommended, there is no objection to the silk and wool; and in summer many persons would prefer the all-silk garments. There is much to be said in favour of each, and all may be recommended as healthful wear. A notable feature of the Crape of Health is that it does not shrink in washing, although the mode of cleansing is partly by boiling. These undergarments may be ordered through any draper or hosier; the wholesale agents are Messrs. Howell & Co., 60 Watling Street, E.C.

NEW DUSTBIN AND CINDER-SIFTER.

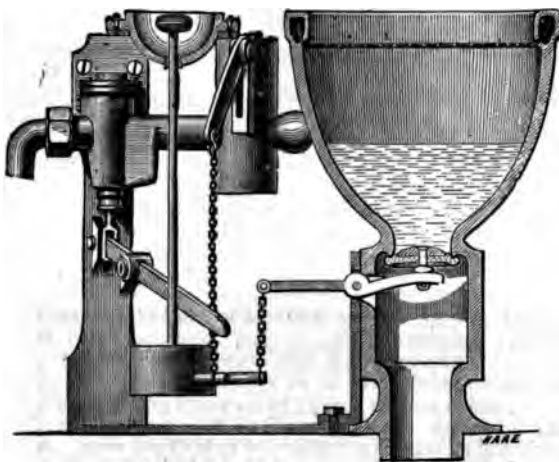
SOME little time since attention was drawn in the *SANITARY RECORD* to a new Dustbin and Cinder-Sifter introduced by Mr. J. P. Cook, 34 Snow Hill, E.C. As the method of removal of dust from our large and populous centres is still a very vexed question, and has, in connection with the Health Exhibition, been recently made a prominent topic, a recapitulation of the merits of the useful and efficient apparatus illustrated below will not be out of



place. Its salient features are, first, that it combines a cinder-sifter and dustbin in one conveniently-sized apparatus, it being so arranged that the contents thrown into it must pass through the sieve, with the result that the cinders are arrested and may be easily removed for further use, while the dust and refuse fall below; secondly, it is large enough for a few days' collection, but, running on wheels, it may stand in any out-of-the-way place, and when full be taken straight to the dust-cart and emptied without the least nuisance; a matter of no little importance considering the mess and litter usually made by dustmen. It is eminently adapted for workhouses, or, in fact, for any public institution, while 'materfamilias' cannot but pronounce it to be an useful invention. Three or four of these cinder-sifters have lately been supplied to Her Majesty's prisons at Perth and Edinburgh.

PEARSON'S PATENT 'WATER ECONOMISING' CLOSET.

MESSRS. CAPPER, SON, & CO., of Ingram Court, Fenchurch Street, the proprietors of Pearson's 'Twin Basin' closet, which has had such exceptional success, have recently introduced a new closet (illustrated below), named as at head of this notice. It is designed to meet the



requirements of the water companies for a simple and effective valve-closet. A special feature in the invention is that the valve-box is made in one piece of glazed earthenware with the basin, which prevents corrosion, as in the case of the usual metal ones, and the seating of the valve

which retains the water in the basin is also of earthenware. The other commendable feature is the absence of a water-waste-preventing cistern, the arrangement of the flush being performed by a new patent double valve, noiseless in action, and fitted under the seat, which appears to be unerring in action, and, it is said, works equally well under high or low pressure, insuring a perfect after-flush. The idea of making all the parts of the ware is new in valve-closets, and cannot fail to be appreciated.

SAWYER'S PATENT INTERNATIONAL FILTERS.

A CHALLENGE of a very bold character will be the advertising columns of the *SANITARY RECORD*. Sawyer's Patent International Water Filter (25 Adelaide Street, London Bridge). Exception may be made by some makers to a competitor taking such a challenge, but they may consider that as their filters are supported under test by the jurors at the Health Exhibition, they should be sufficient; but challenges by private parties are by no means rare. Our columns will be open to suggestions filter manufacturers may think proper on the subject, and a copy of this issue of the *SANITARY RECORD* will be posted to every known filter maker in this view.

A sectional illustration of the Sawyer filter is given by which it will be seen that it is of very simple construction. The unfiltered water is placed in the top



from whence it flows down a central pipe the interior of a hollow cone-shaped block of filtering material, the weight of water above forcing it through the walls of the filtering body and the loose material to the centre compartment, a perforated plate into from whence it is drawn off for use. The filter medium is placed, is sunk or dish-shaped, which collects the matters held in suspension by the water, and their coming in contact with the filtering block, placed underneath or brought to the front, as illustrated, enables it to be drawn off daily. If strictly carried out, a cleansing of the filter may be taken place every twenty-four hours, a desideratum devoutly to be wished. The filtering medium, in the hollow cone-shaped body, is either of fine granular charcoal, or a patented material, composed of ingredients, of which the company are patentees. A point in this filter is that the whole—incl. the chambers for filtered and unfiltered water—is in one piece of earthenware, so that leakages between cannot occur, and no artificial joints or connections to be made. To put in the filtering medium the filter is turned upside down, and, when filled, an earthenware cap is fixed over it and secured by cement. The main stress upon the easy mode of cleansing and maintaining that if this is attended to, the filter will pass pure water, no matter what the source for the unfiltered supply is obtained, for five years,

ply of material will be required. This assertion cannot be tested; but there are commendable in the construction of the Sawyer filter that are of consideration.

CORRESPONDENCE.

communications must bear the signature of the writer, not necessarily for publication.]

VENTILATION AND VENTILATORS.

subject leads to more controversy than any other with building for the reason, we suppose, that, but not seen, and few professional men take the pains to learn the laws which govern the direction of winds. We are indebted to Mr. Sampson Low, Esq., for the following remarks on the subject, commend themselves to us on account of their fairness, the desire evinced to discuss the subject and to much of the misapprehension which, partly ignorance, and partly through the wilful misstatement of interested persons, exists in the minds of the public. The great agents upon which we depend for natural ventilation are three in number. First, the diffusion of gases. Secondly, the power of the wind which occasionally has to be 'manipulated,' and the advantage of using automatic ventilators. Thirdly, the movements produced by the difference in the columns of air at different temperatures.

It is a well-known fact, of course, that every gas 'diffuses' inversely as the square root of its density, but perhaps the general public are not so well acquainted with the following fact, that this tendency to diffusion is so great as to take place even through brick walls—of course the amount of 'ventilation' which is effected in this way is practically nil, but 'diffusion' comes a very important factor in ventilation, as we come to deal with 'inlet' and 'outlet' shafts. The wind may be utilised directly as a ventilating agent by 'perflation,' but it is not in that way that it affects our present subject. When a body of air is in motion (or in other words when the wind is blowing) it sets in motion all the air in its immediate neighbourhood.

Air is propelled before it, and it causes a partial vacuum on either side of its path, towards which vacuum the air in the vicinity flows at (or nearly at) right angles. The result is that the upward current in chimneys and ventilators is obtained.

The wind may, however, by the pressure which it exerts, mounting often to 8 ounces to the square foot, or pressing down the orifice of an open shaft, impede the upward current, and in such cases the utility of properly-constructed ventilators is manifest.

The air in any compartment may be heated by a fire or by a life, or if it be impregnated with vapour, it will rise, and if there be any outlet, part of it will escape, and the air which remains will be lighter than an equal volume of the air external to the compartment: the external air will then rush in through every chink and crevice, and 'equilibrium' is established.

Again, it is a very important factor, which, if we allow it so to do, will assist us much in providing a satisfactory system of ventilation.

Now, if we briefly considered the natural forces which assist in natural ventilation, let us now inquire into the real use of ventilators. All that should be expected of these instruments is that they should materially assist the natural up-current, and prevent the wind from blowing down a pipe (i.e. prevent the wind from temporarily reversing the natural air current) by deflecting it and so that it passes over the orifice of the ventilator, thus securing the good effects of the wind and guarding against

its downward pressure. They seek to assist the exhaust current, we take it, by offering to the wind a larger orifice to extract from than would be afforded if the shaft terminated in a plain open end. They seek to guard against the ill effects of the wind by deflecting it (by means of 'louvres,' 'domes,' 'cones,' and other contrivances too numerous to mention) and causing it to pass straight over such extracting orifices (or orifice) as may exist in the ventilator.

Automatic ventilators may, we think, be conveniently divided into two main groups—

A. Fixed-headed ventilators.

B. Revolving or rotating ventilators.

And we may again subdivide A into—

A.—1. Ventilators using the extracting power of the wind horizontally.

A.—2.—Ventilators using the extracting power of the wind vertically.

Whilst group B may be classed—

B.—1. Cows revolving on the Archimedean screw principle.

B.—2. Cows rotating on fixed bearing-points.

With regard to unfortunate 'Group B,' in general, the following are very great disadvantages:—The friction caused by the constant rotation. The constant wearing away of 'bearing-points,' &c., and liability to get out of order by 'canting' to one side, &c. Requiring attention in the shape of oiling and so forth.

When we come to consider the efficiency, or the reverse, of the 'Archimedean screw pattern' of ventilators, we are led to propound to ourselves the following problem:—Under favourable conditions the up-current in a plain upcast shaft (of say 9-inch diameter) is 500 feet per minute; to obtain this speed (or, in other words, to allow this amount of air to pass), at what rate would a 'screw' of this pattern have to revolve? Shall we say thirteen times per second?

With regard to arriving at the relative merits of the many 'fixed headed' ventilators which are now offered to the public, we are met at the outset of our inquiry by the great difficulty of the various sizes of 'heads' which we see attached to—say a 9-in. diameter pipe—and to attempt to arrive at any accurate relative results from the discrepancies arising from this source is like comparing the results obtained from one engine whose driving wheel is 8-feet diameter with the results obtained from another having a driving wheel of 4-feet diameter.

Mr. Low has long been endeavouring to promote a scheme for testing the relative merits for all fixed head ventilators, on some basis of equality, the outlines for which we append,

1. That the ventilators should be tested on the U tube system.

2. That the same anemometer be used throughout the testing.

3. That the term 'Ventilator' be understood to mean 'the apparatus from the point where the plain shaft ends, to the extreme summit of such apparatus.'

4. That the 'Ventilator' shall be able to be contained within a square of definite dimensions.

5. That the length of pipe attached to each such 'Ventilator' shall be the same in every case.

6. That all such sizes and dimensions shall be agreed upon prior to competing.

Hoping that the above will draw forth the opinions of some of your correspondents.—We are, your obedient servants,

SHARP & Co.

11 Holborn Circus, London, E.C.

VENTILATION.

During the past few years science has made most rapid strides in all branches, and on this account we are able to live more luxuriously and healthily than did our forefathers. We may even go so far as to say that some diseases have been stamped out entirely, black-death and plague being never heard of in the British Isles, and other

pulmonary and cutaneous diseases do not commit the ravages they used to.

The question which naturally presents itself is, what is the cause of this? The answer is briefly this, that the medical and engineering professions have joined hands and act in unison with the one laudable object in view—to save their fellow creatures and increase the strength of their country by preventing and removing the causes which have given and still give rise to disease, and the one great proof of this is to be seen in the International Health Exhibition.

A vast number of diseases, such as typhus, erysipelas, small-pox, &c., arise from overcrowding, filth, and bad ventilation. I am not so presumptuous or so trusting in man's strength to even hint that we can entirely prevent such diseases, for that ever is and must be in God's hands alone; but what I do say is this, that it has been put in our power to guard against them, and it is our duty to do so.

I have made it my special business for some time past to carefully study the question of ventilation, with a view to discover the best means of ventilating all buildings, and I may certainly be allowed to state, without fear of contradiction, that very few of the means applied in any way attain their object. It is not ventilating a chamber to simply create a draught, nor is it ventilating a chamber to simply cut holes in the walls and place gratings over them; but the secret of ventilating is to allow the pure air in without inconvenience to the inhabitants, and to abstract the foul or vitiated air at as regular a rate as possible, without noise and without unsightly objects in the building.

For ventilating a chamber the principal facts to be ascertained are the entire feet of air contained in the chamber, the maximum number of people likely to be in the chamber at one time, allowing for each person at the rate of at least 3,000 cubic feet of air per hour, taking into consideration the important question of how the chamber is to be lighted when gas consumes the entire amount of 8 cubic feet, 1 lb. of oil from 140 to 160 cubic feet per hour, candles six to the pound about 170 per hour.

In proof of what I have above stated, allow me to quote what Dr. Guy says:—'In the twelfth century there were fifteen widespread epidemics and many famines. In the thirteenth century there were twenty epidemics and nineteen famines, and in the fourteenth century there were eight epidemics and more famines.' Dr. Guy then goes on to say that 'these epidemics, it should be remembered, were not local outbreaks appearing only here and there, but they spread so far and wide that each and all of them were regarded as visitations of national disaster.'

In tracing epidemics it will be seen that black-death in 1348 swept away one-fourth of the entire population, and the same style of illness was scourging the whole of Europe, carried partly, no doubt, by infection, but caused principally, there is every reason to believe, by the sanitary condition then existing. The sweating sickness, which was dispelled by the great fire of 1666, and which, it appears, originated in this country, was proved to arise from bad ventilation. Now since the change of sanitation, which took place about the beginning of the eighteenth century, what great results can be shown? Simply that black-death, sweating sickness, and plague have been removed from the bills of mortality.

Again, Mr. John Howard reduced the ravaging effects of jail typhus fever by introducing ventilation.

Surely with such startling facts before one it is not too much to ask architects, engineers, and builders to make special provision in their plans and estimates for so necessary a part of their work, and to ask medical men and the public generally to see that all public and private buildings are properly ventilated.

I may add, in conclusion, that it has been my special interest and pleasure to carefully examine all the systems of ventilation exhibited at the International Health Exhibition, and the only one which I can honestly recommend, and that I do very strongly, is the one exhibited by Messrs.

Aldous & Son. Their exhaust is the only one which is really sealed from downward draught, and which acts thoroughly at all variations of wind and temperature, and it is, moreover, impossible for it to get out of order, the whole of it being stationary and self-acting.

WARREN HENRY DRAKE,
1 Westminster Chambers.

HOUSING OF THE WORKING CLASSES.

*'How best to help the slender store,
How mend the dwellings of the poor?'*

LIVERPOOL LABOURERS' DWELLINGS COMPANY, LIMITED.—At the thirteenth annual meeting of the Liverpool Labourers' Dwellings Company, Limited, the report presented by the directors, which was unanimously adopted, stated that the demand for cottages had fallen off, and many cottages having remained empty, the rents were considerably reduced. Although this step was taken the directors were glad to state that the gross rents received only showed a diminution of about 10%, as compared with last year, and the cottages had been better tenanted. The expenditure showed a decrease of about 30% as compared with last year. The net profit on the year's working was 515/ 4s. 6d., and adding to this sum the amount carried forward from last year, 11/ 4s. 4d., there was a sum of 526/ 8s. 10d. available for dividend. The directors recommended that a sum of 496/ 4s. be applied to the payment of a dividend at the rate of 3 per cent. per annum, and that the balance of 30/ 4s. 4d. be carried forward to next year.

PRISON SITES FOR INDUSTRIAL DWELLINGS.—The suggestion which has been made by Mr. W. McCullagh Torrens, M.P., a member of the Royal Commission on the Housing of the Working Classes, that the Government should remove into the suburbs the prisons and lunatic asylums which now occupy so large a space in densely populated districts of central London—the vacated sites being utilised for artisans' and labourers' dwellings—has been received with much favour in North London, particularly in Clerkenwell and St. Luke's. In the former parish, surrounded by a crowded population of poor people, stands the House of Detention, which is admittedly ill-adapted and inadequate for the purposes it has to serve, while Coldbath Fields House of Correction, a little further away, covers eight or nine acres of ground, in a locality where industrial dwellings are most needed. The St. Luke's Asylum, in Old Street, a very grim and prison-like edifice, occupies a vast space in a district where the want of decent accommodation for the working classes is greatly felt. The patients in this institution would, it is said, no doubt be benefited by being removed into the country. With the rapid growth of the metropolis the prisons and asylum mentioned—originally situate in green fields—are now almost in the very centre of London, and in the midst of a crowded population of poor folks to whom it is of the utmost advantage to live near the scenes of their daily toil.

WORKMEN'S DWELLINGS.—A company called the National Conservative Industrial Dwellings Association (Limited), with an authorised capital of 999,900d., has just been incorporated for the purpose of constructing sanitary dwellings for artisans, labourers, and others, and of enabling working men to become the owners of their own houses, cottages, or agricultural allotments by a system of payments extending over a term of years. The association, which will own freehold property only, and be conducted on sound and strict business lines, will not confine its operations to crowded neighbourhoods. Besides erecting improved sanitary dwellings in populous districts, it will construct cottage residences at low rents in the suburbs, and as a special feature will, by making

arrangements with the railway companies, comprise the cost of the tenants' season tickets in the rents. In country districts the association proposes to build cottages for agricultural labourers, and to acquire land for subdivision into allotments. In order to identify the association with the working classes, and to give them a share in its control, a large amount of industrial stock will be issued exclusively to working men. It is claimed that the association will offer an absolutely safe security for the investment of small savings, and thus foster self-help among artisans and labourers as much by improvement in their personal and domestic surroundings as by placing within their reach the means and the incentives for the cultivation of provident habits. It may be added that the association is promoted by gentlemen closely connected with the Conservative party as an earnest of the real and practical interest taken by them in the social wellbeing of the working classes.

THE HOMES OF THE JEWISH POOR.—The Sanitary Inspector to the Jewish Board of Guardians has recently visited 1,151 houses inhabited by Jews in the district of Whitechapel, and gives the following as the result of his inspection:—Found perfect, 911; entirely remedied, 71; partially so, 54; requiring remedy, 115. 'The Inspector,' the report goes on to say, 'in choosing the districts and houses to visit, has sought to inspect first those in the most crowded districts in which the Jewish poor generally live, and those houses apparently in the worst condition. It is satisfactory to find that of 1,151 houses visited, only 240 required to be put in a more sanitary condition. The 71 houses in which entire remedy has been procured have often been improved by drawing the attention of the landlords to their unsanitary state; but in some cases the parish authorities had to be asked to insist on the remedy. Of the 115 cases where remedy is still required about one-half are under the inspector's supervision, and some remedy may be expected without delay.' It was explained that the word 'perfect' as applying to 911 houses, meant that they were up to the average condition of houses not requiring repair.

PARKS AND OPEN SPACES.

*The law condemns both man and woman
Who steals the goose from off the common;
But lets the greater felon loose,
Who steals the common from the goose.*

THE Mayor of Bradford has opened the Bradford Moor Recreation Grounds, which have been dedicated to the use of the public by the Town Council. An estate consisting of forty-eight acres of moorland having been purchased at a cost of 10,000*l.* by the Corporation, an excellent site, comprising one-third of the whole, has been laid out as pleasure-grounds, 8,000*l.* being spent in the ornamentation of the land, the formation of lawns for tennis, football, cricket, and other outdoor games.

OWING to the efforts of the Metropolitan Public Garden, Boulevard, and Playground Association the enclosure in another London square has been thrown open for the use and recreation of the public. Following the example of the Duke of Westminster in the case of Ebury Square, Pimlico, the Marquis of Northampton has leased to the association named, of which Lord Brabazon is president, about an acre and a half of garden ground in Canonbury Square, Islington, at a merely peppercorn rental. The society has supplied it with seats, and they will provide a caretaker. Lady Brabazon formally declared the garden of Canonbury Square open to the public in the presence of a numerous and representative assemblage, including Lord Brabazon, the Rev. D. Wilson, vicar of Islington, the Rev. Dr. Allon, Mr. Ernest Hart, Dr. Septimus Gibbon, medical officer of health for the Holborn district, and many others.

TREE PLANTING IN LONDON.—Trees are about to be planted on each side of the improved portion of Gray's Inn Road, and it is expected that the planting will be continued by the St. Pancras Vestry on the part of the thoroughfare which is under their jurisdiction as far as King's Cross. The contemplated improvement will convert a rather dingy road into a handsome promenade, especially in the fine wide portion of Gray's Inn Road, stretching from Holborn Town Hall to High Holborn.

SANITARY JOTTINGS.

SANITARY.

THE report of the medical officer of health of Sandown, Isle of Wight, for the quarter ending June 30, shows one of the lowest death-rates ever known in the south of England. Out of a population of close upon 4,000 inhabitants only three deaths had occurred.

The Reddish Local Board having obtained an order from the Local Government Board suspending the Rivers Pollution Act, 1876, have given instructions to Mr. R. Vawser, C.E., Manchester, to prepare a plan for the complete sewerage of the district.

The Tyne Port Sanitary Authority have provided a new floating hospital, which is moored near Jarrow Slakes. It was formerly a Dutch galliot, and the deck space now contains two wards—one for eight beds, and the other for four beds. The cabin has been fitted up for the accommodation of a nurse, and the hold has been utilised as a store room. The work has been satisfactorily carried out under the superintendence of Mr. J. H. Taylor, the Chief Inspector of the Authority. The offer of the *Plouër* by the Admiralty for the above purpose has been declined.

Professor De Chaumont, Medical Officer of the Privy Council, has recently been on an official tour of inspection to the chief towns on the Tyne, and has expressed his satisfaction at the arrangements made to prevent the importation of cholera from abroad and the spread of infectious disease generally.

The death-rate of the borough of Gateshead for the past month again exhibits the excessive average of 30 in the 1,000 per annum. This high mortality is still engaging the earnest attention of the Corporation.

Small-pox has recently been very prevalent in the city and county of Durham, though, according to the latest returns, it shows signs of abatement.

Scarlet fever is still the most prevalent of zymotic diseases at Newcastle-on-Tyne.

The Ellis Lever Prize of £500 for an approved safety lamp has not been awarded, the adjudicators—Thomas Burt, M.P., Sir Frederick A. Abel, Profs. Gryll Adams and S. P. Thompson—not being able to discover a lamp, amongst the 108 brought before them, which fulfilled the conditions required.

Dr. Robert Koch has been appointed Director of the new Hygienic Institute attached to the University of Berlin.

NOTICES OF MEETINGS.

THE PLUMBERS' CONFERENCE AT THE HEALTH EXHIBITION.

AT a representative meeting of gentlemen interested in the art and trade of plumbing held at the Guildhall on the 26th ult., to take into consideration the desirability of action being taken, by which the status of the trade might be advanced, and the interest of the public protected from evil arising from bad work and bad workmen, Mr. George Shaw, C.C. (master of the Plumbers' Company), was elected to the chair.

The chairman, in addressing the meeting, said they had met there as members of the public as well as plumbers, and they wanted protection for themselves and families against the evils arising from bad plumbing. The protection of the public and the protection of the interests of the craft and trade of plumbing

were virtually synonymous terms. The foundation of the Plumbers' Company rested on this sound basis. The 'ordnance' of King Edward III., dated 1365, provided 'That no one of the trade of plumbers shall meddle with works touching such trade, except by assent of the best and most skilled men in the said trade; testifying that he knows how well and lawfully to do his work; that so the said trade may not be scandalised, or the commonalty damaged and deceived by folks who do not know their trade.' The 'ordnance' further provided for good material being used. There was no trade or craft, continued Mr. Shaw, which so directly affected the public health as that of plumbers. The object of the proposed conference would be to give practical expression to the 'ordnance' of the Plumbers' Company. That company comprised among its members men who, like himself, had worked with their own hands in every branch of the plumbing trade, and who had acquired their experience both as men and as masters. In addition, the Plumbers' Company had members who were professional men, and men whose social position enabled and entitled them to support the credit of the body and to advance its usefulness. It was therefore in as good a state of efficiency now as at any previous time in its long history to perform its appropriate and legitimate functions for the fair protection of the public, as well as for those who honestly followed the trade and craft of plumbers.

Resolutions were passed requesting the Plumbers' Company to communicate with the National Health Society, the Sanitary Institute, and otherwise to arrange for the conference of metropolitan and provincial plumbers to be held at the Heath Exhibition from Oct. 15 to 20. A committee was appointed to arrange and carry out the objects of the meeting.

The following syllabus of subjects was decided upon for discussion at the conference:—1. The technical instruction of plumbers. 2. Apprenticeship, the duration and condition of indentures suited to the present state of the plumbing trade and to the modern system of technical instruction. 3. The establishment of metropolitan and provincial boards of examiners of plumbing work. 4. The registration of journeymen plumbers. 5. The suitability of materials used in plumbing, and particularly of those materials recently introduced as substitutes for lead. 6. The desirability of fixing upon a system by which uniformity in the quality of material used in plumbing may be insured. 7. The formation of district associations of plumbers to investigate and secure, as far as practicable, corrections of evils and abuses arising in connection with the trade. 8. A general and executive committee to be formed for the purpose of receiving reports from district associations of plumbers and others with a view to the preparation of a general report by the Plumbers' Company, to form the basis of an appeal to Parliament for necessary amendments and extensions of the law relating to plumbers' work under the Building and Health Acts, and otherwise.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

SESSION, 1884.

T. ORME DUDFIELD, M.D., President.

The first meeting of the session will be held on Friday, October 17, at 7.30 P.M. The minutes of the last meeting will be read. The council will present a report. Mr. Hugh Stott, medical officer of health of Friern Barnet (proposed by Dr. J. Northcote Vinen and Mr. Shirley Murphy) will be balloted for as a member of the society. Dr. Frederick East, of 2 Clapton Square, E. (proposed Dr. G. P. Bate and Mr. Shirley Murphy) will be ballotted for as an associate of the society. The president will deliver an inaugural address. The president, in the name of the society, will present to Dr. J. Northcote Vinen, vice-president, a copy of a resolution adopted at their last meeting of the society, and testifying to their high appreciation of Dr. Vinen's services as honorary secretary to the society during a period of twenty-one years.

SHIRLEY F. MURPHY, 153 Camden Road, NW.

C. E. SAUNDERS, M.D., 21 Lower Seymour Street, W.
Hon. Secretaries.

APPOINTMENTS UNDER THE PUBLIC HEALTH ACT.

MEDICAL OFFICERS OF HEALTH.

- AITCHISON, Dr. Henry, has been appointed Medical Officer of Health for the Wallsend District, in succession to his father.
- ALLISON, John, L.F.P.S.Glasg., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Bridlington Urban Sanitary District, at £50 for one year.
- ASHWORTH, James Henry, L.R.C.P.Edin., and L.M., F.F.P.S. Glasg., L.S.A.Lond., has been re-appointed Medical Officer of Health for the No. 1 Division of the Halstead Rural Sanitary District, at £44 for one year.
- BARTON, John Arondel, M.B.C.M.Univ.Glasg., has been re-appointed Medical Officer of Health for the St. George Urban Sanitary District, at £50 for one year.
- BELL, Peter Gordon, L.R.C.P.Edin., L.R.C.S.Edin., has been re-appointed Medical Officer of Health for the No. 1 Division of the Burton-upon-Trent Rural Sanitary District, at £50 for one year.
- BOSWELL, John Irvine, L.R.C.P.Lond., M.R.C.S.Eng., has been appointed Medical Officer of Health for the Faversham Urban Sanitary District till Lady Day 1886, at the rate of £45 per annum, and for the Faversham Port Sanitary District till Lady Day 1885, at the rate of £15 per annum, *vice* Atthill, resigned.
- BROMLEY, John Bourne, M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the No. 2 Division of the Halstead Rural Sanitary District, at £60 for one year.

- CLARK, William Wake, M.D.Univ.Edin., M.R.C.S.F Lond., has been re-appointed Medical Officer of Health for the Wellingborough Urban Sanitary District, at £30 per annum.
- DANIEL, Edwin, L.R.C.P.Edin., L.F.P.S.Glasg., and has been re-appointed Medical Officer of Health for the 2 Sanitary District, at £25, for one year.
- DAVIDSON, Patrick Moir, L.R.C.P.Edin., and L.M Glasg., has been re-appointed Medical Officer of Health for the Congleton Urban Sanitary District, at £20 for one year.
- DAVIES, John Hopkyn, M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the 1 Margam Urban Sanitary District, at £30 per annum.
- ELLIOTT, George Hurlstone, M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Chic Sanitary District, at £55, for one year.
- FISHER, Luke, M.D.Univ.St.And., M.R.C.S.Eng., I has been re-appointed Medical Officer of Health for the Urban Sanitary District, at £55, for the year ending next.
- FORSYTH, Robert Adam, M.D., has been re-appointed Medical Officer of Health for the Drighlington Urban Sanitary District, at £18 for one year.
- GARMAN, Walter Chancellor, M.B., C.M.Univ.Edin., has been appointed Medical Officer of Health for the Wedne Sanitary District, at £84 per annum, *vice* John Cook, L.R.C.P.Lond., M.R.C.S.Eng., resigned.
- HARDWICK, William Wright, M.R.C.P.Edin., and L.M Glasg., has been appointed Medical Officer of Health for the Harwich Urban and Port Sanitary Districts, at £45 *vice* Kinsey-Morgan, resigned.
- HASWELL, Narcis Richard, M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the 11 Sanitary District, for six months ending Lady-day rate of £100 per annum.
- HEPWORTH, William, M.R.C.S.Eng., has been re-appointed Medical Officer of Health for the Yeaddon Urban Sanitary District, at £15 for one year.
- HOOPER, Alfred, M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the No. 2 Division of the Trent Rural Sanitary District, at £30 for one year.
- HOSGOOD, William, M.B., C.M., Univ.Edin., has been appointed Medical Officer of Health for the Amersham Rural Sanitary District, at £50, for one year.
- MILLETT, George Bown, L.R.C.P.Edin., M.R.C.S.F Lond., has been re-appointed Medical Officer of Health for the Penance Urban Sanitary District, at £40 for the Sept. 29, 1885.
- MORTON, Dr. John, has been re-appointed Medical Officer of Health for the Guildford Urban Sanitary District, at £42 per annum, for three years.
- NORMAN, John William, L.R.C.P.Edin., has been appointed Medical Officer of Health for the Ross Rural Sanitary District, at £60 per annum, for three years.
- VIANT, Henry, L.R.C.P.Edin., M.R.C.S.Eng., and L.Lond., has been appointed Medical Officer of Health for the New Forest Rural Sanitary District, at £100 per annum, *vice* Jenkins, deceased.
- WHITTERTON, John, L.R.C.P.Edin., M.R.C.S.Eng., I has been re-appointed Medical Officer of Health for the Bierley Urban Sanitary District, at £70 for one year.

SURVEYORS, CLERKS TO GUARDIANS, INSPECTORS OF NUISANCES, &c.

- BARRS, Mr. Thomas, has been re-appointed Inspector of Nuisances for the Bromyard Rural Sanitary District, at £60 for one year.
- BRECHING, Mr. Charles Edward, Banker, has been appointed Treasurer to the newly-formed Bexhill Local Board Sanitary Authority.
- BETTS, Mr. Charles Lineker, has been appointed Collector of District Rates to the Melton Mowbray Local Board Sanitary Authority, at £40 per annum, *vice* Cobley.
- BOWRING, Mr. John, has been elected a Member of the 1 Local Board and Urban Sanitary Authority, *vice* deceased.
- BREEZE, Mr. John, has been re-appointed Surveyor of Nuisances to the Wellington (Salop) Rural Sanitary District, at £140 per annum.
- BROWNE, Mr. Rowland, Solicitor, has been appointed Clerk to the Carmarthen Guardians at £85 per annum, and Clerk to the Rural Sanitary Authority, the Assessment Committee, the School Attendance Committee, at such salary as may be from time to time, and fees as Superintendent Registrar &c., and Returning Officer, *vice* Phillips, deceased.
- BURGES, Mr. Isaac, has been appointed Inspector of Nuisances for the East Hampstead Rural Sanitary District, at £70 per annum, and Surveyor for the Sandhurst division, at £10 per annum, *vice* the Brackhill Division, at £10 per annum.
- BURGOYNE, Mr. James, has been appointed Collector to the Local Board and Urban Sanitary Authority, at 20 annuam, *vice* Hooke, resigned.
- CHAPMAN, Mr. John James, has been re-appointed Inspector of Nuisances for the Stone Urban Sanitary District, at £40 per annum. (He is also Surveyor at £50 per annum.)
- CLAUGHTON, Mr. Joseph, has been elected a Member of the 10th Local Board and Urban Sanitary Authority, *vice* resigned.
- CLAYTON, Mr. Edward, has been re-appointed Inspector of Nuisances for the Mansfield Urban Sanitary District, at £30 per annum, until May 2, 1885.

JOLES, Mr. Robert, has been elected a Member of the Sidmouth Local Board and Urban Sanitary Authority, *vice* Harvey, deceased.

DOKE, Mr. Walter, has been elected a Member of the Claines Local Board and Urban Sanitary Authority, *vice* Rowe, resigned.

RYTH, Mr. John, has been re-appointed Inspector of Nuisances for the North Bierley Urban Sanitary District, Yorkshire, at £30 for one year.

SOLDSTONE, Mr. F. B. T., Manager of the Newport Branch of the Capital and Counties Bank, has been appointed Treasurer to the Town Council and Urban Sanitary Authority of Newport, I.W., *vice* Grant, resigned.

SHANAM, Mr. Joseph, has been appointed a Collector to the Corporation and Urban Sanitary of Sunderland, *vice* Bradley, resigned.

SHIFFITT, Mr. D., Manager of the National Provincial Bank, Denbigh, has been appointed Treasurer to the Town Council and Urban Sanitary Authority of Denbigh, *vice* Pritchard, resigned.

SHAWCOCK, Captain, has been elected a Member of the Board of Hove Improvement Commissioners and Urban Sanitary Authority, for the Brunswick Ward, *vice* Baron de Teissier, deceased.

HASTIE, Mr. Arthur Hepburn, Solicitor, has been appointed Clerk to the newly-formed East Grinstead Local Board and Urban Sanitary Authority.

HEDGES, Mr. Francis Edward, Solicitor, has been appointed Town Clerk and Clerk to the Urban Sanitary Authority of Wallingford, at £55 per annum, *vice* Mr. Charles Hedges (his father), resigned.

KOLVOAK, Mr. Henry D., has been elected a Member of the Ashbourne Local Board and Urban Sanitary Authority, *vice* Lucas, resigned.

JEFFERIES, Mr. William, has been elected Chairman of the Bromsgrove Board of Improvement Commissioners and Urban Sanitary Authority for the ensuing year.

JERSON, Mr. —, of Stockport, has been appointed Inspector of Nuisances for the Market Harborough Rural Sanitary District, at £110, and Surveyor at £90 per annum, from year to year, *vice* Wills, appointed Surveyor and Inspector of Nuisances to the Wavertree Local Board and Urban Sanitary Authority.

JOYCE, Mr. Thomas John, has been re-appointed an Inspector of Nuisances for the Helston Rural Sanitary District, for six months ending Lady Day next, at the rate of 20 guineas per annum.

LEWIS Mr. Lewis, has been elected a Member of the Board of Hove Improvement Commissioners and Urban Sanitary Authority, for the Stanford Ward.

LOCAS, Mr. Alfred, has been elected a Member of the Board of Hove Improvement Commissioners and Urban Sanitary Authority, for the Stanford Ward.

MADAM, Mr. James, has been appointed Treasurer to the newly-formed Margam Local Board and Urban Sanitary Authority.

MAUGHAN, Mr. J., the late Surveyor, has been appointed Consulting Surveyor to the Town Council and Urban Sanitary Authority of Great Grimsby, at £100 per annum.

MILNER, Mr. Thomas George, has been appointed Accountant to the Town Council and Urban Sanitary Authority of Kingston-upon-Hull, at £500 per annum, *vice* Thelwall, appointed Treasurer.

MOLVEX, Mr. Herbert, has been elected a Member of the Milverton Local Board and Urban Sanitary Authority, *vice* Bell, resigned.

MONKS, Mr. Aquila, has been appointed Clerk to the Stapleton Local Board and Urban Sanitary Authority, at £50 per annum, *vice* Rawle.

NANKIVELL, Mr. W. H., has been re-appointed Inspector of Nuisances for the East Dereham Urban Sanitary District, at £50 for one year.

NORMAN, Mr. Joseph C., has been elected a member of the Hadleigh Local Board and Urban Sanitary Authority, *vice* Cook, deceased.

PASCOE, Mr. Joseph, has been re-appointed an Inspector of Nuisances for the Helston Rural Sanitary District, for six months ending Lady-day next, at the rate of £30 per annum.

PERY, Mr. William, has been appointed Surveyor to the Town Council and Urban Sanitary Authority of Stourbridge, at £40 per annum, *vice* Taylor, resigned.

PHILLIPS, Mr. Alfred, has been appointed Surveyor and Inspector of Nuisances to the Ely Local Board and Urban Sanitary Authority, at £150 per annum, *vice* Bowen, resigned.

ULLINGRE, Mr. George Bonamy, has been re-appointed Inspector of Nuisances for the Chichester Rural Sanitary District, at £33s. for one year.

RITCHARD, Mr. Hugh Foulkes, Branch Manager of the National Provincial Bank of England, has been appointed Treasurer to the Corporation and Urban Sanitary Authority of Carmarthen, *vice* Thomas, deceased.

ATTE, Mr. William, has been appointed Surveyor and Inspector of Nuisances to the Lillingdon Local Board and Urban Sanitary Authority, at £77 per annum, *vice* Bradford, resigned.

RYTH, Mr. Emmett, has been re-appointed Inspector of Nuisances for the Hebden Bridge Urban Sanitary District, at £70 per annum for two years.

RAY, Mr. Robert, has been elected a Member for the Eccles Ward of the Barton, Eccles, Winton, and Monton Local Board and Urban Sanitary Authority, *vice* Waddington, deceased.

REY, Mr. Stephen, has been re-appointed Inspector of Nuisances for the St. George Urban Sanitary District, at £50 for one year.

ALBERT, Mr. C. R. M., M.P., has been elected Chairman of the newly-formed Margam Local Board and Urban Sanitary Authority, Glamorganshire.

THELWALL, Mr. John, has been appointed Treasurer to the Town Council and Urban Sanitary Authority of Kingston-upon-Hull, at £400 per annum, *vice* Witty, deceased.

THOMAS, Mr. William, has been appointed Surveyor and Inspector of Nuisances to the newly-formed Margam Local Board and Urban Sanitary Authority, Glamorganshire, at £20 and £30 per annum.

THOMAS, Mr. William Edmond, has been re-appointed Surveyor and Inspector of Nuisances to the Neath Rural Sanitary Authority, at £160 for one year.

THORPE, Mr. Joseph Lloyd, has been appointed Collector to the Elland Local Board and Urban Sanitary Authority, at £75 per annum, *vice* Iredale, resigned.

TIFFEN, Mr. Thomas, has been re-appointed Surveyor, Inspector of Nuisances, Water Works Manager, and Collector to the Wigton Local Board and Urban Sanitary Authority, at £95 per annum.

WARD, Mr. Amos, has been elected a Member of the Pudsey Local Board and Urban Sanitary Authority, *vice* Tunnicliffe, resigned.

WHITESIDE, Mr. Thomas, has been re-appointed Inspector of Nuisances for the Lytham Urban Sanitary District, at £50 per annum.

VACANCIES.

MEDICAL OFFICER OF HEALTH for the Nottingham Urban Sanitary District. Application to the Town Clerk.

MEDICAL OFFICER OF HEALTH for the East Grinstead Urban Sanitary District. Application to A. H. Hastie, Clerk to the Authority.

MEDICAL OFFICER OF HEALTH for the Gainsborough Rural Sanitary District.

MEDICAL OFFICER OF HEALTH for the Stafford Urban Sanitary District. Application to the Town Clerk.

MEDICAL OFFICER OF HEALTH for the Bridgnorth Urban Sanitary District. Application to the Town Clerk.

CLERK to the Hemel Hempstead Guardians and Rural Sanitary Authority. Application to the Chairman.

CLERK to the Margam Local Board and Urban Sanitary Authority. Application to the Chairman, Margam, near Neath.

SURVEYOR to the Town Council and Urban Sanitary Authority of Great Grimsby: £300 per annum, with a clerk, and permission to take pupils. Application, 18th inst., to W. Grange, Town Clerk.

INSPECTOR OF NUISANCES and **SURVEYOR** for the Bangor and Beaumaris Rural Sanitary District: £130 and £20 per annum for three years. Application, 30th inst., to John Thomas, Clerk to the Authority, Bangor.

SURVEYOR and **INSPECTOR OF NUISANCES** to the East Grinstead Local Board and Urban Sanitary Authority: £100 per annum. Application to A. H. Hastie, Clerk.

SURVEYOR to the Shirley and Freemantle Local Board and Urban Sanitary Authority. Application to the Clerk.

SURVEYOR to the Loughborough Local Board and Urban Sanitary Authority. Application to the Clerk.

SURVEYOR to the Kenilworth Local Board and Urban Sanitary Authority. Application to the Clerk.

SURVEYOR, INSPECTOR OF NUISANCES, and COLLECTOR to the Consett Local Board and Urban Sanitary Authority. Application to Thomas William Welford, jun., Clerk.

SURVEYOR to the Lytham Improvement Commissioners and Urban Sanitary Authority. Application to W. Blackhurst, Clerk.

INSPECTOR OF NUISANCES for the Longton Urban Sanitary District: £100 per annum. Application, 27th inst., to George Hulme Hawley, Town Clerk.

INSPECTOR OF NUISANCES for the Matlock Urban Sanitary District. Application to John William Skidmore, Clerk to the Authority.

COLLECTOR to the Margam Local Board and Urban Sanitary Authority. Application to the Chairman.

LOCAL INTELLIGENCE.

ABERGAVENNY IMPROVEMENT COMMISSIONERS AND URBAN SANITARY AUTHORITY.—At the annual election the following were elected for the ensuing three years, viz.: Messrs. *H. J. Cadogan with 148 votes, T. Delafield 131, *John Morgan, 130, and *Captain W. Williams 127. (*Retiring Commissioners re-elected.)

BROMSGROVE IMPROVEMENT COMMISSIONERS AND URBAN SANITARY AUTHORITY.—The following have been elected Members of the Board for the ensuing three years:—Messrs. Joseph Amphlett, Thomas Newbold, Joseph Weaver, Robert A. Hall, and Thomas Billingham.

CHESHAM LOCAL BOARD AND URBAN SANITARY AUTHORITY.—The first election of members has resulted in the return of Messrs. William Lowndes by 659 votes, Edward Simmons by 511, David Hawkins 476, George Webb 473, Alfred Judge 464, Edwin Birch 450, Frank Lovel Lasenby 429, Thomas Nash 418, and Charles Herbert 414.

The Camborne Local Board and Urban Sanitary Authority have increased the salary of Mr. Thomas Negus, the Surveyor and Inspector of Nuisances, to £107 10s. per annum.

Mr. John Gannon, Chairman of the Cavan Town Commissioners and Urban Sanitary Authority, has been placed on the Commission of Peace for the County Cavan.

The Dawlish Local Board and Urban Sanitary Authority have increased the salary of Mr. John Sumner Whidborne, the Clerk, from £50 to £70 per annum.

The Flint Gas and Water Company have offered their undertakings to the Town Council and Urban Sanitary Authority at a price to be settled by arbitration, and the offer has been accepted.

The Town Council and Urban Sanitary Authority of Cheltenham have increased the salary of the Surveyor to £525 per annum, upon his taking over the duties of the Highway Inspector, who has resigned.

The Bristol Town Council and Urban Sanitary Authority have voted £300 to Mr. Frederick Ashmead, the Surveyor, for his extra services in connection with the building of the new Bedminster Bridge; and increased the salary of the Assistant Surveyor, from £250 to £300 per annum.

The West Hartlepool Improvement Commissioners and Urban Sanitary Authority have awarded £115 to Mr. W. Procter, Surveyor, Inspector of Nuisances, and Collector to the Seaton Carew Local Board and Urban Sanitary Authority, as compensation for his loss of emolument, upon the Seaton Carew District being dissolved and added to West Hartlepool.

The Mansfield Guardians and Rural Sanitary Authority have increased the salary of Mr. G. H. Hibbert, the Clerk, £50 per annum, 'on the distinct understanding that it is to cover all assistance employed by him, and that no further increase be asked for during his term of office.'

The Hemel Hempstead Guardians and Rural Sanitary Authority at their last meeting, upon the report of the death of Mr. Charles Ehret Grover, their Clerk, passed the following resolution unanimously:—'That the deep and earnest sympathy and regret of this Board at the loss of so valuable a public officer, who from the formation of the Union has so faithfully and ably discharged the duties of his office, be recorded, and that a copy of this resolution be sent to the family.'

The Pudsey Local Board and Urban Sanitary Authority have, with the sanction of the Local Government Board, reduced the salary of Mr. Joseph Town, the Inspector of Nuisances, from £80 to £67 per annum.

The Chertsey Rural Sanitary Authority have been invested with the powers, rights, &c., of an Urban Sanitary Authority, under sect. 45 of 'The Public Health Act,' as to the temporary deposit of dust, ashes, and rubbish, within the contributory place of Chertsey.

Although the Local Government Board have settled the boundaries of a place, and appointed a summoning officer to take the necessary steps for constituting a Local Government district at Chertsey, it is very doubtful if it will be carried out, for at a meeting of the pro Local Board Committee, Mr. G. Boyce, the chairman, said in the face of the expression of feeling shown at a recent public meeting, he did not think it would be advisable to go on with the matter further, although he felt certain the time would come, and that shortly, when the inhabitants would be sorry that the Board was not formed. It was also explained that the committee had succeeded with the Local Government Board in their petition, and that the district carved out by them had been adopted in its entirety. It was also noticeable that since the formation of the committee the existing authorities had done a great deal more for the town. It was determined not to dissolve the committee, but to let the question remain in abeyance.

The Denton and Haughton Local Government Districts were amalgamated on Monday, September 29, in accordance with the order of the Local Government Board. The new district is to be called the 'Denton and Haughton,' and the Board is to consist of fifteen members.

The first election of a Board of nine members for the newly-formed Menai Bridge Local Government District will take place on Dec. 6. The recently-formed East Grinstead Local Board and Urban Sanitary Authority, at their last meeting, discussed the order of retirement of the members; and upon the suggestion of the Rev. C. W. Payne Crawford, the chairman, the names were written on separate pieces of paper, placed in a hat and drawn, with the following result:—Messrs. Padwick, Crawford, Charlwood, and Smeed, to retire at the end of the first year, Messrs. Southey, Gatty, Foster, and Tooth, at the end of the second year, and Messrs. Taylor, Absalom, Stenning, and Bailie, at the end of the third year.

The Windsor Urban Sanitary Authority have increased the salary of their Medical Officer of Health from £40 to £60 a year.

NOTES AND QUERIES.

Having for some time back been in the receipt of Queries appertaining strictly to sanitary work, and which it would be easy to answer, without having to refer our correspondent to competent professional advisers, we have opened a column in which to register such Queries and Replies thereto as can fairly be expected from us; and our subscribers and readers are invited to make such use of this column as will tend to benefit themselves and the community. Both Queries and Replies will, however, be subjected, if unnecessarily long, to a strict curtailment.

130. IRON HOT WATER CISTERNS.

1. How long will a properly galvanised iron hot water cistern last? Why does this kind of cistern soon rust inside and the rust appear outside?

2. Is there any objection to a copper cistern tinned inside (for hot water)?

3. Can you recommend any other kind of cistern for a hot water system?

W. J. S.
1. It is impossible to say how long a galvanised iron cistern will last. A great deal depends upon the proper cleansing after galvanising from the acid used in the process, which very often cannot

be eradicated from the crevices around rivets, where it attacks the metal and eats it into holes, sometimes from the outer, and sometimes from the inner side.

2. A copper-tinned cistern is decidedly the best for a hot-water system, and is not open to any more objection than a copper tea kettle.

3. There is not anything better than copper.—Ed.]

131. WINTER HEALTH RESORTS.

Now that the Continent is practically closed in respect to Winter Health Resorts, I want some particulars of English sea-coast and inland places to which I can send patients requiring mild climates. Do you know of any small manual containing such information?

M.O.H.

[M.O.H. will find the details he desires of the soil, climate, and meteorological characteristics of Hastings and St. Leonards, Eastbourne, Worthing, Ventnor, Bournemouth, Torquay, Pezance, Llandudno, Leamington, Cheltenham, and Bath, all of which are suitable for the purpose indicated, in 'Where to take a Holiday': the Holiday Number of the LONDON MEDICAL RECORD, published by Smith, Elder, & Co., 15 Waterloo Place, S.W. Price 1s.]

INTERNATIONAL HEALTH EXHIBITION.

TO THE PARLIAMENTARY COMMITTEE OF THE MAIN SEWERAGE BOARD OF THE LOWER THAMES VALLEY.

494 South Annexe, Oct. 9, 1884.

Gentlemen,—By a report published in the *Times* of this morning it would appear that you have had referred to you two schemes for the removal or treatment of sewage now discharged from your district into the Thames.

One scheme emanates from Sir Joseph Bazalgette and the other from Mr. W. Shields. The first is said to be merely an elongation of the existing main drainage system, which is well known too frequently to utilise the several outlets to the river. The other the *Times* describes as being based on the conveyance of the sewage of the whole district to a spot at Isleworth within the district, and its chemical purification upon land to be purchased by agreement for that purpose. Now surely this is a revival of the principle rejected last session by the Select Committee of the House of Commons.

In a handbook published under the authority of the Executive Committee here, an eminent authority thus describes a sewer which is made to convey more than a pure effluent:—

'Truly, a sewer is an unlovely thing to think upon, with its stench, gases, and fungi, bred of putrefying liquids seething in the dark. . . . Directly solid refuse is diluted with water its money value vanishes, a though its theoretical manurial value remains.'

Both of the above systems involve enormous cost, the first especially, and experience has taught ratepayers that neither can be remunerative; above all, it is notorious that neither can give adequate relief. The authority above quoted goes on to say:—'It may, I think, in relation to this question of sewage, be laid down as an axiom, the greater the detail the greater the ease, the greater the security to health, and the greater the profit.' Before being biased by the advocates of either of the two schemes in question, it is to be hoped that attention will first be given to the 'Cloacina' principle exhibited here, as it fairly encompasses all the requirements published in the handbook referred to, under the title of 'Our Duty in Regard to Health.' A grave responsibility devolves upon you in giving a decision as to the course to be taken for the relief of dwellers in the Lower Thames Valley, and consequent upon the overflow above described, the dwellers in the Upper Thames district are also concerned in your decision: and the report of the Government Engineer (Mr. Harrison) has sufficiently described the pitiable condition of the river taking the aforesaid overflow.

Till the end of this month the 'Cloacina' models will be here on view, and they show that by 'prompt interception, deodorisation, and filtration in detail,' a pure effluent would alone pass into the river, and the valuable residuum contained in the receiving tanks (after these operations) may be removed in an inodorous condition.

Subways conveying telegraph wires beneath the pavement would best serve towns exercising this mode of treatment, but till local authorities find the courage to form subways, and save the tearing up of their streets upon every little gas and water service operation, till then the devotion of part of the coal cellar of each dwelling would suffice for the 'Cloacina' process, and it should be borne in mind that in no way does it involve the old cesspool nuisance, simply because, independent of the application of cheap and ready disinfectants, the continuity of the sewer or tank with the dwelling is entirely cut off, and the cellars or subway could be ventilated as the sewers now are by gutter gully holes; in suburban districts a pit deep enough to give a fall and to hold a removable galvanised iron tank, possessing a simple arrangement for ventilation, and an escapement for a liberal effluent would at once provide relief for the greater part of the Lower Thames Valley, and should inquiries of the attendant here not be sufficiently explanatory to any member or members of your Board, further particulars may be obtained at the Sanitary Works Office, 12 Buckingham Street, Charing Cross.—I am, gentlemen, yours obediently,

D. NICOLL.

P.S.—An article copied from the *Lancet*, and republished in the *Morning Post* on the 10th inst., should interest all sanitarians. In point of fact, it is as a brief would be, if held by counsel in defence of the 'Cloacina' system.—[ADVT.]

ORIGINAL PAPERS.

RESSURE IN ELEMENTARY SCHOOLS.

By EDITH LUPTON.

bring the subject of over-pressure in schools, and the very varying and contradictions held by writers and speakers on the seems to me that before the subject can be created it will be necessary to come to some definite understanding than at present exists the term over-pressure really means, and to include, and also what methods are to of receiving evidence on the matter. And I should wish to deprecate what I should call the method, by which it is assumed that all the present working of our Education is either foes to educational progress, or are motives of personal interest. A common and must be assumed before any profitable can take place. As to what over-pressure and that most inquiries on the matter begin with the somewhat ghoulish question, 'Are they dead?' and when, happily, there are no returns, it is considered that the subject is closed of, and that no further investigation is

ing of the subject myself, I shall beg to be take much wider ground, and to include in 'over-pressure' any physical or mental to any child as a consequence of the out of the Education Acts. I fear that I take some of my readers with me in this, but it is not generally acknowledged that has any duty towards delicate children. t report of a well-known School Board on ure, which has attracted some attention much quoted, was based on the assumption se of over-pressure, to be well founded, s occurred in a previously *entirely healthy* B. W. Richardson, I think, says that such our present state of civilisation does not s therefore, perhaps, scarcely necessary to most happy paucity of 'cases' was the he inquiry. For myself, I feel the gravest en I hear it said the authorities 'cannot children are delicate;' that the 'system' e lowered to 'suit the requirements of the nd that, in fact, 'killing is no murder,' if poor little victim has had a diseased or stitution. Such a doctrine introduced into ary life would produce rather startling d it is certainly opposed to our general of action. We acknowledge the duty of infant life, however feeble, and the State in numerous and increasing asylums, a place of support for adults who, by reason d or mental weakness, are unfitted to take e in the world; but, by a curious moral school-boy has no place in this chain of ce, and should he be sickly or feeble, he is e soldier in an ill-disciplined army, to drop ranks and die by the wayside. And this e extraordinary, as the school-boy is at a e, when mind and body are peculiarly : to external influences, and when skilled nd mental training may produce the hap- ts on his whole future life. Seeds of disease

may be eradicated, feeble brains strengthened, the blind may see and the deaf hear, and the State may be furnished with able-bodied citizens instead of useless paupers. But the State has not yet recognised a duty in this respect, and of course it may be said that the State, in undertaking to give an elementary education, does not undertake any responsibility as to the health of the children, and that the parents must still be responsible for their physical well-being; but the fact is that successive codes have year by year stretched such increasingly greedy hands over the children that they are now almost entirely taken from the care of their parents, and the legal powers, either actual or assumed, of the educational authorities are so great that parents are simply not allowed to protect their children.

I do not think I am speaking too strongly when I say that a gross and ignorant tyranny has in the name of education risen up amongst us, and that it is time the nation opened its eyes to what is going on.

I am aware that to the various charges brought against the Education Department by parents, doctors, school-managers, and teachers, of causing in various ways injury to the children's health, Her Majesty's inspectors bring in most cases a simple denial. I would not for a moment charge these gentlemen with saying anything which they did not firmly believe to be the truth; but I would ask, Are they in a position to judge? Have they any means of really acquainting themselves with the actual facts concerning the lives and health of the children whom they inspect? To my mind, when these gentlemen say that they have seen no cases of over-pressure, it is as if a man on one side of a brick wall should say that he had not witnessed an occurrence which took place on the other side, and if he should then proceed to generalise from that that nothing did take place, I doubt if his evidence could be very good in law. And here I would remark that I think that in any investigation of the subject of over-pressure, evidence should be received in a judicial manner, and that the same weight should be attached to it as it would have in a court of law; that the letters H.M.I. should not be supposed to confer on their possessor medical knowledge out-weighing that of trained and experienced doctors, and that we shall have no more of such pretended investigation of cases by the Education Department as occurred a few months ago when the evidence of the doctor who had seen and attended the dying child, was considered to have been entirely disproved by an inspector who went down after the child's death and saw her tombstone.

Of the manner in which Dr. Crichton-Browne's evidence has been received by the Government, it seems to me that one can only say it was scandalous, and it has certainly not met with the approval of the nation. No doubt the instructions laid down for inspectors as to the care they are to exercise in supervising the health and general well-being of the children are most seductive, but they prove too much and fail by very excess of merit; for they show that there is evidently no relation between human capacity and the duties imposed by the department on its inspectors. When one has read over and carefully considered the list of all the inspector must do, the time he has to do it in, and the limited opportunities that will be at his command of obtaining information, one is tempted to write at the end: 'which is absurd, therefore —.' But to

proceed to examples. One of our most important schools in Bradford, consisting of four departments, boys, girls, infants, and half-timers (mixed), was examined at the end of September. Four days were allotted for the inspection, one day to each department, and as there were, speaking roughly, three hundred children in each, and reckoning the day at five hours, exactly one minute was left for the personal inspection of each child. Out of that time had to be taken the time required for inspecting log-book, school premises, sanitary arrangements, teachers and pupil teachers. The children had to be examined in reading, writing, arithmetic, singing, sewing, English, geography, elementary science, history, drawing, and algebra. The Infant Department in facts about animals, coal, gas, salt, form, colour, food, plants, clothing, rain, frost, &c., &c.; modelling, geometrical drawing, weaving, plaiting, drill. Then there was the 'merit grant' in all the schools, 'organisation and discipline,' 'intelligence in instruction,' 'behaviour of children,' inspection of the 'exemption schedule' and its authentication 'by attendance officer,' 'children who are present but exempted from examination.' The inspector was here required by his instructions not to accept the statement of the managers, but to inquire for himself whether there was 'adequate reason for withholding;' and was specially warned not to allow too many little fish to escape through his meshes, for his instructions say 'in ordinary conditions such exceptions should be *very few*.' How pleasant that a Government can by a few strokes of its pen thus regulate the health of its people!

Then not only had the inspector to observe all the things just enumerated on the day of inspection, but he had to satisfy himself that in the daily management of the school the children were being brought up in 'habits of punctuality,' 'good manners and language,' 'cleanliness and neatness,' 'cheerful obedience to duty,' 'consideration and respect for others,' 'honour and truthfulness in word and act,' and not only that regard had been paid in classifying them 'to their health, age, and mental capacity;' but—*Credat Judeus!*—that the 'dull and delicate had not been' at any time during the preceding year unduly pressed. And all this in five hours! May we not then feel a little sceptical when we find inspectors sending in medical reports as well? Three hundred children reported on mentally, morally, and medically at the rate of a minute a piece! while I am assured on eminent authority that a medical man can only thoroughly examine from twenty-five to thirty patients in a whole day (and that without regard generally to their minds and morals)!

Then, again, inspectors do not see the schools as they are. The day of inspection is known proximately during the whole year, and the exact day for several weeks previously. The children come with Sunday clothes, clean hands and face and collars—which last are known specially to appeal to masculine sensibilities. I do not believe an inspector ever considered a child morally or physically deficient who was sanctified by a bit of starched linen round his neck.

Close class rooms are shut up, floors are washed, desks polished, windows opened, children adjured with passionate earnestness 'to be good for the inspector.' All are excited, nervous, and eager, looking anxiously for weather-signals in his (the in-

spector's) face, hoping that he will be in an amiable mood or not be obliged 'to catch a train.' No one would dream of revealing to him any defect that could be concealed. He does not come as a friend, as a counsellor, who from his wider experience might give valued advice, judicious blame, and well-deserved praise. No, he comes as an enemy to represent the distrust of the Government for its teachers and people; he comes to deprive teachers of their hard-earned salaries, often of their very subsistence, and, dearer than all, of their reputation; he comes to take away from managers the money which they absolutely require for the carrying on of their schools, and to deny to the people of the town that proportion of their hard earnings which they have voted shall be spent on the education of their children. Can we, then, suppose that gentlemen visiting the schools under the circumstances just described are in a position to give satisfactory evidence as to the working of these schools? No; eminent as are the talents of many, and fruitful of good and pleasure as their visits might be under a more rational system, I do not think that the people of the country will feel that the question of over-pressure can be settled by their reports. For myself, I consider that there is the most pressing and earnest need of proper medical inspection of school-children, and also of a proper revision of our educational system, by those in the country who understand best in what proper educational and physical development consists. I consider that not only are delicate children treated with what is really at times barbarous cruelty, but that the vitality of strong children is often seriously depressed by antiquated and ignorant modes of instruction. That there are many people in the country who could give us the most admirable advice I am well convinced. The present Government did not invent education, and the inheritors of a literature second only in splendour and power to that of the Greeks, and the possessors of a present scientific eminence second to none, need not be the slaves of any governmental system. It is freedom to carry out our best knowledge in the education of our children that we want. As for the necessity of medical inspection, will it be easily credited that there are many poor parents who have to choose between letting a child whom they know to be ill attend school, or being fined or imprisoned? and though a well-to-do man can pay a fine, a poor man will have to go to prison. The following cases are well attested.

Magistrate: 'Why do you not send your little girl to school?'—Father: 'Because she has got rheumatic fever, and nobody shall make me send her.' Fined 10s. 6d.

A mother attends in answer to a summons, which states that her girl, aged 13, does not go to school. Mother says the girl is ailing, and going to school makes her sick and ill. She does not know what ails her, as she is too poor to pay a doctor. Has lost six girls, and fears to lose this one too.

Father ill, out of work; mother, father, and four children live on 11s. a week, earned by mother and eldest boy. Case remanded for School Board officials to get doctor's certificate. Officials do not get certificate, because it is not 'in the Code.' Child taken by myself to see doctor, who says she is suffering from premonitory symptoms of brain-fever, and gives certificate that she must not go to school for six months. If I had not accidentally heard of the case the child would now be forced to go

al, as the father fears much being sent to

met with a severe accident to his head, and clever at his lessons before, became afterwards stupid. Father sent the boy, who could y, to school only half-days, and let him hawk ers the other half. Is told he will be sum-

He takes the boy to the doctor under are he had been after the accident. Doctor hing could be better for the boy under the tances than walking about, and gives certifi- t the boy must only attend school half-days. ate asks why the boy is not attending school e. Father: 'I have a doctor's certificate.' nce Officer: 'This man, your worship, is ntumacious, and defies us!' Magistrate: ust be put a stop to: you are fined 2s. 6d., r boy is to go to school full time.' This ing to the kindness of Mr. Stanley Leighton, ught to the attention of the Education De- it in the House of Commons.

ier case. Child ill from St. Vitus's Dance. sends doctor's certificate, stating that the ist not attend school. Officer presses for a on. Magistrate: 'What reason can you pressing for a fine in the face of this certi- Officer: 'I consider the child to be well.' ate: 'You do not understand: what medical : have you that the child is fit to go to '—Officer: 'I do not consider any medical : needed: I consider the child to be well.' tely this case is dismissed.

Other case a poor woman, whose child had e years been an out-patient at various s for affections of the eyes and ears, y able to go to school very occasionally, ed by the officer and asked why the child :ed at school. The mother said the child unwell, and was then a patient at the Infirmary. The officer said, 'I'll examine ld,' turned her to the light, looked at l said, 'I think she's quite well: you'll noned.' And summoned the woman would een and fined, for hospitals do not give tes, but for another kind appeal to the ent by Mr. Leighton. This child has, I , had her delicacy much increased by im- reatment at school. She was not able to hool on account of ill health till she was At that age the mother thought her much , and that it would be very good for her to e she could get discipline and companion- The doctor under whose care she then was ave a certificate, stating that she was in a of health to attend school, and, with *great* , the child was admitted, the mistress being willing to receive a child who could not ant.' After her admission I called several look after her, and succeeded in impressing school authorities the fact of her delicacy, : she was not to be beaten if she did not understand. Her then improvement in and intelligence showed how beneficial e schooling may be to the most delicate . Unfortunately, however, the child im- o much that the mistress declared (I was the time and did not hear of the matter) considered the child quite well, and should

'work her up' for the examination; and this delicate child of 7 (who was then a patient at the Eye and Ear Hospital) was kept in school from 9 o'clock in the morning till 1, and from 2 till 5 or 5.30 every afternoon, was beaten and scolded if she did not understand or hear, and in a few months she had become pale, thin, and miserable, screaming in her sleep, and her eyes a mass of inflammation. She has never been able to go to school since, and will very likely have to thank the Board School system for permanent injury to her health. I think myself it is simply monstrous that young and feeble children should be allowed to be the sport of such ignorance as I have described; and this child is only one of thousands who are suffering more or less from the same gross violation of the laws of health. I do not think there can be a better example than this case of the benefits of education when the education is for *the child*, and the evils of it when it is for *the grant*.

Some time ago in the Burnley district a little girl died suddenly. At the inquest a verdict was returned that she 'died from attending school while in an unfit state of health.' The parents gave evidence that they knew the child to be unwell (I think her lungs were affected), but that the officer called so often and threatened them with a summons if she did not attend, that they were frightened, and let her go. Of course a Government inquiry was held, and blame was given—to whom? to the officer for his ignorant tyranny? No; to the parents, for having done as he told them!

To leave now exceptional cases, let us inquire how the children as a body are treated according to our system. Great efforts are made by many authorities to get parents to send their children to school at three years of age, and in cases where mothers go out to work it is often necessary to send the younger children somewhere. These children are, as might be expected, generally mere babies, some of them cannot even talk, and common sense and common knowledge knows that at that age it is the physical development that should be most attended to.

Our Board School authorities, however, know nothing of the kind; reading, writing, and arithmetic are with them the Alpha and Omega of all knowledge and virtue. These children are put on benches, often in a half-lighted, close little class-room, and compelled to sit upright and perfectly still for 5½ hours a day, with the exception of one quarter of an hour's run in the playground morning and afternoon. Occasionally a few toys are introduced, but the babies often do not even get the benefit of exercise in the large school-room, which the other infants enjoy, but sit hour after hour staring with unknowing eyes at an alphabet on a board, a teacher standing midway with a long pointer, with which she now points out the letter A and now raps the head of a baby who has not learnt that heads were not meant to be turned. There is no exercise for the lungs, for the arms, for the legs, and no rests for the poor little backs. What the babies think about all day I do not know, but a solemn vacuity seems for the most part to have taken possession of their souls.

Perhaps there is not much active harm done in these schools, and it is more the absence of benefit which might be derived from pleasant playgrounds, floors to roll about on, and games and laughter that is to be deplored. But when the serious business of compulsion begins at five, it is most deplorable that there is not a medical inspection of the children, so

case the law was also violated by the officials, as there is compel a child to attend school after the age of thirteen.

that none may be set to work who are not fit for it. It is then that the half imbecile, scrofulous, rickety children should be weeded out, and should be placed under special medical care, and a course of study suited to their capacities. There is no more painful or condemnatory sight than these poor, obviously feeble children being 'screwed up' by slaps, scoldings, and keepings in to prevent their diminishing the amount of grant earned, suffering themselves and the cause of suffering to their teachers.

I am aware that Art. 8 of the New Code is supposed by the Department and the inspectors to have remedied these evils. 'Dullards are easily protected, and are intended to be protected, by the New Code,' says one sanguine inspector, but practically it does not do more than touch the evil complained of. It has already brought other evil consequences in its train, and has caused so much indignation among parents that if carried out as it has hitherto been I think it will be the last straw which will break down the patience of the long-suffering English ratepayer and parent. Under this clause children are still trained experimentally. No medical opinion is obtained, no dictates even of common sense are heard; the unfortunate child is turned over to the only less unfortunate teacher, and it is only when he has been experimented upon for a year, and has shown that no physical or mental torture can extract any 'results' from him, that he is at the very last 'exempted from examination,' with this result, that while he has suffered from 'over-pressure' during the whole year, he is debarred at the last from the possible chances of a 'pass' at the examination, which might have set him free to follow some manual employment, for which his poor dull faculties might be fitted, and which would bring in for himself and his family some much-needed help. But to return now to the actual school life of the children. In many respects the curriculum of our infant schools is much more satisfactory than that in our other departments. The subjects chosen have an agreeable variety, and I often meet with infants who seem intelligent and interested in their work, who take pride in telling what they have learnt, and in showing how well they can read.

The great defect in these schools is in the want of recognition of how beneficial and necessary activity is to children, and how painful to all, and how impossible to some, is the enforced school quietude, and far too frequently death is the consequence of the hasty blows bestowed to punish children for what is scarcely the crime of being 'wick.'* But as the children go to the upper schools and advance in the standards, this intelligent cheerfulness ceases, the long hours of ceaseless poring over books begins to tell upon them, the subjects taught become more and more removed from any connection with their lives or interests. Astronomy, Physical Geography, History, and Literature, taught merely from the pages of the driest, most unliterary, most unscientific, and most uneducating of class books, what can they do to stimulate the minds and intelligence of the children? They receive no ideas from them. The mental exercise for the most part consists of committing pages to memory, of which they do not understand half the words. I came upon a class of little girls of about ten years of age one day, reading a chapter of feudal history.

* A 'wick' child means in Yorkshire a vigorous, active, lively child.

The page was crammed with such words as 'feoff', 'feoffment,' and other obsolete legal phrases, describing the terms of the feudal tenure, which would have taken a very Blackstone or Hallam to explain; and this we call 'educating' the children and it is for such knowledge as this that inspectors almost tearfully implore that the law may be made stricter so that the children may be compelled to remain in school until they have learnt all that the (the inspectors) can teach them. May Heaven preserve them from such a fate! and may it send instead hearts to feel for their poor aching heads, their sick hearts, and their bewildered brains. As remains of some of that vast inheritance that has come down to us from our Puritan forefathers we still believe in the educational advantages of making children miserable. Would that we could learn to believe in the inestimable advantages of happiness as an educator, and in kindness and consideration as the best means of developing the children's minds. Meantime we have in our school consumptive children, epileptic children, children afflicted with all the evils that flesh, and especially the flesh of poor half-fed, half-clothed children, inherit to (and it must be borne in mind that the children of the poor have not by any means the same physical and nervous strength as the children of well-to-do parents), and all must be bound by absolutely the same system, and a system it is in many cases of Draconian severity. Poverty receives daily physical punishment when the father is out of work and cannot send money for school fees or books, and even to cough is an offence punished with the cane. I have recently been investigating the case of a little girl who has become epileptic through being caned for a cough she could not control, and on my obtaining a medical certificate to save her if possible from future suffering, the matter was merely treated with ridicule, it being considered too ridiculous to suppose that an epileptic child should not be caned, and yet the treatment of epileptic children is a very serious matter, as they are very largely increasing in number in our schools. But of all sources of over-pressure there is none so great as the long school hours now imposed on the children. An average of six hours a day for five days a week for eight years, from five to thirteen, spent in poring over books, to say nothing of constant overtime work, often daily of several hours, and of the fact that in some districts the actual school hours are considerably longer than those I have named (for the Education Department, while strictly fixing a minimum limit for school hours, has adopted no maximum), gives, I think, an amount of attempted brain-work which in itself proves the existence of over-pressure. I know of several well-to-do parents who have wished their daughters to remain at school till fourteen, so that they might receive a good education, who have taken them away as soon as the law allowed, finding the excessive work imposed was injuring their health. Lord Stanley of Alderley called the attention of the Government to this most important point in the House of Lords last session, but the Department of course could not see any occasion for interference, preferring to trust as usual 'that somehow good will be the final goal of ill,' but there is no doubt that the maximum number of school hours should be most strictly and definitely settled. It certainly seems anomalous that while the employer of a full-grown woman may be heavily fined for over-

hour's overtime work, that in the name of on children may be kept at work any number of hours. Such physical torture is never imposed on the children of educated people. An eminent man has said 'we were never intended to spend a large part of our lives in looking at little black and white on a sheet of white paper'; and let us not let people think of the easy school hours of the young children, of the healthy variety of the work taught them, their careful physical training, their long joyous months at the seaside or in the country, and compare these things with the ceaseless work of the poor to which the children of the poor are condemned. The evil effects of constant sedentary work in a confined position on the system are well known to need repetition by me, but it is remembered that the children of the poor have limited capacity and preference for manual work so that in their case the confinement is not so irksome. Many ingenious seats are contrived to prevent children suffering from a stooping posture, but, if I may express an opinion, I do not think children ought ever to sit over their books for long, as to need such appliances, and much as I admire German systems of education, I think they have made a grave mistake in requiring such long hours of work, and especially for English children would I have the great need of plenty of physical activity. Practical energy always acknowledged by none other than the Germans to be the great characteristic of the English nation? then why should we in educating children of the nation run counter to the dominant national characteristic? We talk much of education with a big 'E'; but is education a thing in itself and a thing apart from all other conditions? is it not rather an adaptation of means to ends, and is not that human being the best fitted who has been best fitted for the life he will lead?

Now in England it is scarcely possible to discuss the question calmly, owing to the desperate situation which has arisen that the Germans and French are coming in some mysterious manner, going to take all our land and manufactures away from us, and it is arming the intellects of our children, as we were our volunteers twenty years ago, to repel a French invasion, that we shall continue to do so. Indeed, I think that this present scare is due to that in the person of 'Boney' frightened our fathers so many years ago. Meantime our legislators take hasty trips abroad and with scraps of continental educational systems hung about them, somewhat in the fashion of a savage adorns his person with beads from the East, and when any remonstrances are made of the desirability of our adopting the same, we are told by our rulers, with alarm in their eyes and with the loss of all our trade; unless we make the greatest exertions we shall soon have no trade. Of course if our present Educational Code is the national armament it perhaps should not be subjected to much educational or medical criticism. I would remind our rulers that people are not educated by having a portion of a continental system rudely grafted on the top of their life, but that the savage before referred to is the man when he dons a chimney-pot hat or waistcoat emblematic of his adhesion to civilisation and

wish to educate we must first consider what the people want, class wants, local economic wants,

and last, but not least, the personal wants and individuality of each little child. The *Times*, whose educational views are certainly a little 'mixed,' after insisting one day on the merits of our present system gave a day or two after an article in praise of the methods of education pursued by the Christian Brothers. With true liberality the *Times* will evidently give all systems a place in its Pantheon. The system of the Christian Brothers is, I may say, the exact opposite of ours. The individual capacity of each child is specially studied. No books are used in teaching young children, and those as young as ten or even eight mingle manual labour with their intellectual activities. This is what we want in England: half-time schools, where girls, beside moderate intellectual attainments, may learn cooking, sewing, house work, dairy work, and other industrial employments; where boys may be instructed in those trades they will afterwards have to follow, and learn to take an intelligent interest in and have an intelligent knowledge of their work. A man who is only going to be a weaver will drive his machine all the better for understanding the principles on which it is constructed, and a girl who marries at sixteen will surely be a better wife for knowing something of the duties she undertakes. The deadly languor and hatred of schooling which has no practical connection with either their past or their future lives, and which increases on children with every year of their school life, will pass away, and we shall have children coming to school full of eagerness to learn what will be of practical value to them.

Of the evils that are brought about by want of food I will not speak, because they are obvious; nor will I enter into the question of the injury done by the pass examinations for labour certificates, as that, though important, is more a local perhaps than a national question; and of the evils of payment by results so much has been said and so eloquently that I will only allude to it, but I believe it to be the prime cause of all the evils complained of in physical, mental, and last, but not least, moral deterioration. The children are taken out of the hands of their parents, teachers, fellow townsmen, and all who might be supposed to take, or who do take, an interest in them, and are tied to the wheels of a Government system to revolve as the State decrees. It is true that I heard the noble President of the Education Department lately say how very easy that system was, but that made me think of some of the wonderful machines to which our century has given birth, and in which, by means of a little handle that a child can turn, an almost irresistible machine is set in motion. It is no doubt easy for the President to sit in his chair and sign the necessary documents, but he does not see the enormous flywheels whirling in the distant parts of the country which start into life at the strokes of his pen.

Of course, I know it may be said that most of the evils complained of are in the power of the school managers to remedy if only instead of trying to earn money they would think of the welfare of the children; but the fact is money is necessary to managers to enable them to carry on their schools. We have long heard of the wicked teachers who actually wish to have money to live upon, and now we are beginning to hear of the equally wicked school managers who wish for money to enable them to carry on their schools. The mistake is that

the Government regards the money it gives as a reward. It is not so; it is the necessary money voted by the nation for the education of its children, and of which all schools require their share. It is childish to tell us that we must make our schools efficient and never mind whether we get money to support them or not; and when inspectors actually tell us that many of our schools would be more efficient if they earned less Government grant, and that to make them efficient we must not try for grant, I consider that the system is self-condemned by the mouths of its own supporters. Independence of the Government grant is all we want, and the law will then allow us to take our proper place as school managers; but as long as we have to earn money we must earn it how we can, and we have now to earn it by being managers in little more than name, and by paying a slavish obedience to the slightest regulation of a department which thinks that from a single office at Whitehall it is capable of regulating the individual life of each one of the millions of school children under its dominion. That it cannot do this successfully is, I think, becoming increasingly evident, and I hope most earnestly that the public attention which is being at present bestowed on the subject will result in the establishment of an educational system more suited to the needs of a great and progressive nation and to the physical and mental wants of each individual child.

SMALL POX IN DURHAM.—In response to a requisition to the mayor a public meeting of the inhabitants of the City of Durham has been held to consider the best steps to be taken to prevent the further spread of small-pox now so prevalent in that city. There was a numerous attendance of the leading gentlemen of the city and university under the presidency of the mayor. Dr. Lake, Dean of Durham, in moving the first resolution, urged the necessity of promptly providing a temporary hospital or other place for the proper isolation of patients, in which he was supported by other speakers, the resolution being carried unanimously. On the motion of Archdeacon Watkins it was resolved 'that the clergy, all ministers of religion, and medical men residing in the city act as a committee to provide immediately trained nurses for the poor now suffering from small-pox.' At the monthly meeting of the Durham Urban Authority held on the 5th instant, the Finance and General Purposes Committee recommended the authority to apply to the county justices for the use of old militia stores as a hospital for infectious diseases; as also to the Race Committee for the use of the Grand Stand for that purpose, as well as to the Dean and Chapter for land to be used also for checking the progress of the disease. Two memorials were read praying the authority to take prompt measures to stay the spread of the disease and to provide a hospital at once. The town clerk read the report of the medical officer of health (Dr. Barron), wherein it appears that officer has repeatedly urged upon the authority the necessity of providing a hospital ever since the first appearance of the disease in that city, and the necessity had daily become more urgent. Fifteen deaths from the disease had occurred during the month of October. It was interfering with trade and causing much misery. Mr. Barnes complained of the culpable manner in which persons affected with the disease exposed themselves in the streets. It was suggested that schools be closed during the prevalence of the epidemic. It was announced that the justices were willing to grant the use of the militia barracks for a hospital, and they have since been utilised for that purpose. Canon Body has taken the initiative and secured the services of trained nurses to visit the sick at their homes and to provide necessary comforts.

THE HOUSING OF THE POOR.*

By JOHN PRICE.

Resident-Director of the Newcastle Industrial Dwellings.

AFTER so much has been said and written on the important subject of housing the poor, I fear it is somewhat difficult to avoid travelling to some extent over well-trodden ground; yet I trust that the experience of one who has been intimately associated with the working classes for a very long period, and who has also for the past fourteen years been resident manager of a large block of industrial dwellings, may not be found entirely devoid of interest. A person who occupies such a position obviously enjoys greater facilities for practically studying the question than those who are not afforded such opportunities.

The poor may be divided into two great sections, the deserving and the undeserving. Whilst the former are entitled to our warmest sympathy and support, as being placed in their unfortunate position through no fault of their own; the latter are poor, and probably always will be poor, on account of their own vicious habits, which seem as difficult to get rid of as for the Ethiopian to change his skin. Poverty is caused quite as much by the waste of money as by the want of it. If the two sections could always be kept apart, the great problem of the hour would be much nearer a solution than it appears to be at present. We find the victims of vice and misfortune so mingled together in the slums of our large towns that sanitary and other conveniences, which are much appreciated by the well-disposed, are continually neutralised or destroyed by people who are equally regardless of their own and neighbours' health and comfort as they are of their landlord's pocket.

It will be generally found that it is this dirty, destructive, and non-rent-paying class that are most blatant over their self-inflicted grievances, and impose on unwary philanthropists by their plausible fictions. If these people were put into mansions of faultless construction and spotless cleanliness, they would, if allowed, soon reduce their new homes to the condition of their former hovels: squalid nurseries of filth, disease, and vice. It certainly seems unreasonable to be continually harassing the landlords of property inhabited by such people to keep it in thorough repair, when they know the impossibility of the task from bitter experience; and that whatever repairs they do will be speedily undone by malicious and unprofitable tenants. No greater hallucination can exist than to imagine that property inhabited by a disreputable class of tenants is really such an El Dorado as is sometimes represented by writers, who are guided more by sentiment than a desire to learn the truth. The fact is, such property seldom proves remunerative, as the occupants not only cause the unfortunate landlord endless trouble and expense in repairs, but resort to every known artifice to avoid paying rent at all. It is scarcely necessary to observe that, as a rule, their household requisites are distinguished by their scantiness and portable character, so that, if desirable, a sudden change of residence can be accomplished with remarkable celerity. I have known cases where the owners of tenemented property in Newcastle have actually given it away rather than be further subjected to the annoyance and expense which it entailed.

* Read at the Newcastle Diocesan Conference, Oct. 30, 1884.

It may naturally be asked, Why do landlords or their agents admit such undesirable tenants into their property? In answer to which question it may be stated that no sane person would do so knowingly; but in spite of all the precautions taken they get admission most frequently by practising gross deception.

In seeking admission such applicants prove themselves adepts at simulation, and occasionally present themselves with borrowed clothes on their backs, a well-filled rent-book and forged character in their hands; this trick, along with a plausible tale of their antecedents, sometimes succeeds in throwing the landlord or agent off his guard; as he cannot always spare time to verify credentials, he may trust to appearances and is thus deceived. It sometimes happens that a respectable-looking relative of the family is employed to take a room or house for the intended occupants, when their own appearance is not considered prepossessing. Once in possession they can cause the landlord considerable trouble and loss, before they can be ejected in legal form, which is a dilatory and expensive process, and is only resorted to under compulsion. From the constant frauds to which landlords and their agents are subject, they have now become much more wary than they were formerly, and disreputable parties now find it a more difficult task to impose on them. It would be absurd to deny that bad landlords do exist, but in the majority of cases it will be found that it is bad tenants that make bad landlords.

From long personal observation, I have no hesitation in expressing my opinion, which is but the echo of other persons of equal experience, that the primary cause of much of the poverty and wretchedness to be met with in the slums of Newcastle, as well as of other large towns, arises from a constant craving for drink by the inhabitants, which destroys all regard for the best affections of human nature, and for everything calculated to make a happy home.

The numerous temperance agencies that have been established in Newcastle, have undoubtedly done much good amongst the male population of the working class; but it is a lamentable fact that drinking amongst women is alarmingly on the increase.

As home is the birthplace of all that is good or evil in man, no effort should be spared to preserve the purity of the domestic hearth; the best of all reforms begin at home and cannot be accomplished without the voluntary aid of wives, mothers, and daughters; it is important that we enlist them under the right banner. Here the clergy can render efficient aid.

But, from whatever cause these nurseries of disease and vice have sprung up in our midst, it is a most suicidal policy to allow them to remain, impregnating the atmosphere, physical and moral, with their foulness; they should be uprooted at all hazards, as their injurious effects are seldom confined to the locality where they originate. Infectious disease spurns geographical boundaries and class distinctions, and although generated in wretched hovels, often finds its way by subtle means to the mansions of the rich, selecting its victims with startling impartiality. We therefore cannot afford to ignore its existence; self-interest, if no higher consideration, should prompt us to take energetic steps for its removal. The longer we suffer the cancer to grow, with apathetic indifference, the more dangerous it will become, and the more difficult to remove. The evil must, therefore, be

faced boldly if we desire an efficient cure, but how is this desirable result to be accomplished?

In my humble opinion, the initiative rests with the sanitary authorities, whose staff should be augmented if required, so as to enable them to make an efficient inspection of all houses periodically, so that they may detect any defects of construction as well as the existence of any nuisance detrimental to the public health. It is desirable that vigorous efforts be made to find out and punish the real offenders, who create the nuisances, and not, as is often the case now, to visit the shortcomings of bad tenants upon the head of their unfortunate landlord who is frequently made to pay dearly for the removal of nuisances of whose existence he was probably ignorant till pointed out to him by the authorities.

Malicious tenants, who were in arrears of rent, have been known to stop up drains and water-closets, or do other wilful damage, and then coolly report the existence of the nuisance to the inspector, with the object of gratifying their petty spite at their landlord's expense. Sanitary officers thus sometimes unwittingly become the catspaw of bad tenants, and owners of tenemented property more particularly complain bitterly of this annoyance, which would soon abate if the real offenders were reached and punished; depraved minds only practise virtue under compulsion. We have seen the excellent results of the police supervision of common lodging-houses; the system should be extended in a certain degree to tenemented dwellings. The Corporation of Newcastle seem desirous of carrying out this view, and have recently passed a set of by-laws under the 90th section of the Public Health Act, which are not altogether of a satisfactory character; whilst some of the clauses justly affect dirty tenants, by other clauses landlords will be subject to much unnecessary trouble and expense, through the default of their tenants. These obnoxious clauses have created much dissatisfaction amongst owners of tenemented property, which possibly may lead to some desirable modification of them. Otherwise landlords may prefer, as the lesser of two evils, to shut up their property rather than be subject to further irritating annoyance and loss. Thus the injudicious exercise of stringent powers may intensify the difficulty, by leading to the continued eviction of the most troublesome class, who must find accommodation somewhere, and at somebody's expense, even if it be the ratepayers. We cannot expect landlords to ruin themselves for the benefit of worthless tenants. It will be obvious that the death-rate of a locality is often quite as dependent on the habits of the residents, as upon the construction of their habitations, and therefore the death-rate of a place cannot always be regarded as an infallible test of its normal healthiness. And here I may observe that the Church can render valuable aid by instructing her clergy to strive all in their power to inculcate the necessity of habits of temperance and cleanliness amongst their parishioners; if this could be accomplished, they would find their future work much more pleasant. It has been well said that cleanliness is next to godliness.

Having thus referred to the people and causes which make our slums a disgrace to us, and thwart in no small degree the best efforts of the clergy, sanitarians, and philanthropists, we will now take a glance at the more agreeable side of the picture, and consider the wants of the really deserving poor—unfortunately a numerous class, whom it is unjust

to punish or neglect for the faults of their less deserving brethren.

In going through the slums of our large towns we sometimes come across a humble dwelling which arrests our attention by the contrast it affords to its surroundings—a clean, bright spot or oasis in a wilderness of filth, whose occupants, despite their misfortunes and scanty furniture, have not forgotten the lessons of cleanliness engrafted into them during their earlier and happier days: this is the class that wins our sympathy. Compelled by necessity, and not from inclination, to inhabit places whose only attraction is their low rental, as best suited to their limited resources, and to herd amongst those whose antecedents and habits are very different to their own, they evidently endeavour to put the best face on their misfortune, and show us that even our slums, with their manifold defects, can be made to present a much cleaner and healthier appearance than they generally do. The principal cause of poverty amongst the deserving class is the want of employment, now unhappily so prevalent, and sickness, contingencies which cannot be avoided by the keenest human foresight.

It should be clearly apparent that the majority of the labouring poor cannot afford at any time to pay any proportionally large amount out of their slender and uncertain earnings in the shape of rent. There are hundreds of men in Newcastle who in the best of times cannot earn more than 20s. per week to keep themselves and their families; at present, many would probably be thankful for a fraction of that sum. Much as these poor people may appreciate healthy homes and sanitary conveniences, they are often far beyond their reach, and they are compelled to subjugate their desires to their means. Two shillings per week is the utmost that most unskilled labourers can afford to pay out of their weekly earnings for their dwellings; and many cannot pay even that sum with a due regard to the necessities of their families. Unfortunately no one has yet been able to show us any practical plan by which suitable dwellings could be erected on a sound commercial basis, at a cheap rate, so as to let at this low rental, and yet produce a satisfactory return as an investment, though many efforts have been made. The excellent work of Miss Octavia Hill and her coadjutors may be said to come the nearest to the desired end; but it must be remembered that her plan of transforming old houses into improved dwellings is only available to a limited extent, where opportunities occur, so that her laudable and economical system can only be regarded as but a partial remedy for housing the multitudinous poor, who require to be dealt with on a much larger scale.

The authorities of several of our large towns have shown their sincere anxiety to grapple with this important question in a practical manner. It is now thirty-two years since the Corporation of London took the matter in hand, and before the passing of Sir R. Cross's Act in 1875 they had provided accommodation for 1,800 persons. They have just erected a block in Petticoat Square for about 1,000 persons, at an estimated cost of 68,000*l.* It is not necessary to refer at length to the many blocks of model dwellings which have been erected in London during recent years, for although the majority of them have proved a gratifying success in a commercial sense, their erection does not seem to have benefited the real poor to any appreciable extent, not even excepting the magnificent blocks belonging to the Peabody Trust.

One of the most exhaustive and able paper has yet appeared on this subject was read at the Liverpool Diocesan Conference last year. Mr. Forwood, Chairman of the Insanitary Committee of the Liverpool Corporation, which will be found in another interesting matter of a kindred nature in the *SANITARY RECORD* (December 15, 1883), I may note, has devoted a considerable portion of its valuable space to the ventilation of this important question for many years past.

After studying the question carefully, Mr. Forwood declares his conviction that when it is clearly seen that the public health is endangered by the effects of overcrowding and insanitary houses, private enterprise is unable or unwilling to remedy the evil, it is the duty of the authorities to step in, matter boldly and provide a remedy, even at the cost of that such action may entail a loss. The Corporation of Liverpool, acting on this advice, are at present erecting a building at Nash Grove thirteen blocks of 10 dwellings, five storeys high, at an estimated cost of 55,000*l.*, exclusive of the cost of the ground. Erections are also projected. (*See SANITARY RECORD* for March 15, page 437.) Mr. Forwood is of opinion that the block system offers the cheapest means of providing suitable dwellings for labourers, near to their work, at low rentals, and it is desirable that such rents, if possible, should not exceed one shilling per week per room. The plan is intended to place such accommodation within the reach of the very poor. The objections on which theorists against the block system of dwellings on the score of unhealthiness, have now been exploded by the practical experience gained in the numerous blocks of model dwellings which have been erected in London and elsewhere.

Dublin is another city where more than 100 houses have been erected under Sir R. Cross's Acts has been carried out. The Corporation cleared a large area at a cost of 24,000*l.*, and in order to encourage the erection of dwellings for the labouring class let it to the Dublin Artisans' Dwellings Corporation at the nominal rent of 200*l.* per annum. Encouraged, the company has already built 600 houses specially adapted to the requirements of the class, and are about to erect 400 more on the same site. Dr. Cameron, of Dublin, is another authority who is also of opinion that in default of action taken by any other agency it is the duty of municipal authorities to make some provision for housing the very poor.

The authorities of Belfast have given an impetus to the erection of houses for the working class by making a material reduction in the rates for the class of property; houses under 20*l.* per annum being allowed a reduction of 50 per cent. in their regular assessment; a further reduction of 25 per cent. is allowed on houses under 8*l.* per annum. Provided the rates are paid promptly by the tenants within a month of the date of the assessment. Under such liberal treatment it is not surprising that the working class of Belfast are much better housed in the shape of house accommodation than their brethren resident in other large towns. The self-contained cottages of two and three rooms, with the usual conveniences, are to be had at from 3*s.* 6*d.* per week, and prove amply remunerative at those figures.

In Birmingham the authorities may also be said to have led the van in sanitary reform during recent years. By their energy and liberal ex-

considerable amount of money in improvement have accomplished a complete and satisfaction in the sanitary aspect of that large important borough, including the erection of labourers' dwellings. It was stated by Dr. at the recent Social Science Congress held that he did not believe that there were more than a dozen instances of families occupying but a room to each family in that town—a marked contrast to what he had seen there before, and to what is now to be found elsewhere. The excellent work accomplished by the City of Glasgow Improvement is so well known, that it is merely to mention it as showing the good authorities can do in this direction when so aided.

These authorities have set an excellent example to other Corporations. Newcastle, where so large a proportion of the population reside in tenements of but one or two rooms, a practical effort has been made, or aid given to the Corporation to provide accommodation for many hundreds of the labouring poor who are unhoused during recent years, on account of streets and other improvements, although the necessity for doing so has been freely admitted, and the purpose has been prepared on several occasions. This omission has been keenly felt by the labourers, who now find it very difficult to find a home suited to their requirements within the limits of their work. These so-called improvements have also pressed very hardly on the poor of London, as by them 22,000 persons have been housed, whilst accommodation has only been provided for about 14,000 on or near the site of their dwellings. The grievance has perhaps been more acutely felt in Newcastle by the Quayside, whose only chance of a temporary job depends on their presence upon the spot when a ship or other vessel arrives. It is bitter irony that these poor people to reside a mile or more from their work, as many are now compelled to leave their former habitations in the neighbourhood being pulled down.

The principal effort that has been made in Newcastle to meet the urgent want of dwellings near the docks was undertaken by the company with which the honour of being connected, which, along with other philanthropic works, owes its formation to the indomitable energy of Mr. James Wilson, present chairman. In 1870 the company erected a small experimental block of forty-four dwellings, which proved a great success. It was filled with good tenants, the demand for being much greater than the supply, and, therefore, shareholders provided most of the capital, and were rewarded with the fair dividend of 5 per cent. in nine years successively after the opening of the dwellings, showing conclusively that in Newcastle, when properly supported, such an undertaking does not prove a bad investment, independent of the good work it may accomplish. This success induced the company to make an effort to erect a larger block, but unfortunately at that time it does not appear to have been in quite so much haste as at present, and the appeal of the public for the increase of capital necessary to carry out their proposed extension met with a poor response.

It was evident that the proposed extension would have to be abandoned unless the aid of a Government loan or some other means of raising necessary capital was sought. After much con-

sideration the company applied to the Public Works Loan Commissioners for a loan equal to one-half the cost of the proposed extensions, which was granted. As this loan is repayable, both principal and interest, in heavy annual instalments, it formed a somewhat serious charge on the company for the first few years after it was granted, engrossing a considerable portion of the annual revenue, which would have otherwise been applicable to the payment of dividends if the whole of the capital had been provided by shareholders. A large portion of the capital sum has already been repaid, and of course the balance is reduced yearly. The shareholders will ultimately reap the reward of their pluck and patience, as their property becomes annually enhanced in value, with the advantage of undeniable security. With the aid of the increased capital thus obtained in 1879 the company extended their block by the addition of other sixty-four sets of two-room dwellings and shops—as well as a large room used for instruction and recreation. The whole of the dwellings are now fully let, with numerous applicants waiting for vacancies. This year the company paid a dividend of 3½ per cent.; their resources have been much crippled by the payment of house duty and other onerous rates and taxes, to which similar buildings elsewhere are more or less exempt. The buildings now accommodate 500 persons, chiefly of the labouring class. Of course the London companies, with a different class of tenants, and a rental at least 25 per cent. higher than can be obtained in the provinces for similar accommodation, are able to show more favourable returns, but the results will always be governed by local circumstances. For instance, whilst some of the blocks of the London Improved Industrial Dwellings Company pay as much as 8 per cent., their blocks at Wapping (which for situation and class of tenants bear the greatest affinity to the block of the Newcastle company) only paid 1½ per cent. last half-year, but from the great number of their blocks in various parts of London, which command higher rents, the company are able to equalise their dividends and pay a uniform 5 per cent. It has been suggested that the Corporation of Newcastle might well follow the example of the authorities I have quoted; for, with the abundance of land of their own in eligible situations at their disposal, and with a competent official staff, they are able to erect a large block of dwellings for the labouring class at a much less cost, and therefore, at a lower yet remunerative rental than can be expected of any public company or private individual who do not possess such advantages.

Beyond this, surely the hundreds of poor people who have been unhoused by the Corporation during recent years have some claim to their consideration. If unwilling to build themselves, the Corporation might render material assistance to those who recognise the great want of dwellings for the poor, and may feel disposed to meet it.

The principal facts that have been elicited after all that has been written and said on this subject may be thus summarised.

1st. That the poor of the labouring class, out of their limited resources, cannot afford to pay more than a rental of from one to two shillings per week for their dwellings, of whatever size and construction and wheresoever situate.

2nd. That no practical plan has yet been devised by which dwellings can be built, which, after paying a fair market price for land, labour, and material,

can be let at these low rentals and prove remunerative to the builders.

3rd. If this desirable end is to be accomplished it must depend, to some extent, on philanthropic aid, either from Government, corporate authorities, or private individuals.

4th. The most efficient aid that the Government can give is to grant loans at a low rate of interest—say 2½ per cent.—to companies who erect dwellings at a low rent for the *bonâ fide* poor, the repayment of such loans to extend over a longer period than is now the custom (thirty years).

5th. That it shall be incumbent on corporate authorities as the appointed guardians of the public health, where the want of proper dwellings for the poor is shown to exist, to provide sites for the erection of such dwellings; and, in order to encourage such erection, to grant a reduction of rates, or afford such other aid, as may enable the promoters to secure a satisfactory return.

6th. That the sanitary officers should take more vigorous action under the powers already conferred upon them to improve the condition of existing dwellings and the removal of nuisances, whether caused by bad tenants, or the neglect of unscrupulous landlords, care being taken to reach the real offenders.

SODA AND MINERAL WATERS.—The Commissioner of Health (Dr. Raymond), by virtue of the power conferred upon him by law, has declared the following practices dangerous and detrimental to public health, and has therefore prohibited the same in the city of Brooklyn:—(1) The storage, keeping, selling, or having for sale, of soda water or mineral water in tin-washed copper fountains or vessels. (2) The storage, keeping, selling, or having for sale, of soda water, mineral water, syrups, or flavouring extracts, in vessels composed in whole or in part of copper, lead, or other poisonous substance in which the soda water, mineral water, syrup, or flavouring extracts come in contact with the copper, lead, or other poisonous substance. (3) The selling, delivering, or draughting of soda water, mineral water, syrups, or flavouring extracts through pipes, faucets, or taps, composed in whole or part of copper, lead, or other poisonous substance, unless such pipes, faucets, or taps are so lined, coated, or protected as that the soda water, mineral water, syrup, or flavouring extracts cannot come in contact with the copper, lead, or other poisonous substance composing the same. The commissioner states that, in reference to the above declaration and order, the evidence as given in the recent hearings satisfied him that the probability of soda water and mineral water becoming contaminated with poisonous substances was very great, and that an examination just made by the chemist of the department (Dr. Bartley) confirms this opinion. In this examination Dr. Bartley visited fifty-five localities where soda and mineral water were sold. These localities were not selected, and included some of the principal thoroughfares of the city. In these fifty-five examinations copper was found in the syrup in eight and in the soda or mineral water in seventeen instances. In this tour of inspection he found but four tin-washed copper fountains in use, and in every one the soda water contained copper.

A MILKMAN DISSEMINATING FEVER.—At the Berwick Police Court, William Scott, a cow-keeper at Tweedmouth, was charged with contravention of the order of the Privy Council by allowing milk to be sold whilst there was typhoid fever in his house. It was stated that up to that time no less than twenty-three cases of fever had been traced to milk sold from Scott's house after the disease had broken out there. He was fined in the mitigated penalty of three guineas; a somewhat mysterious decision.

THE REGULATION AND REGISTRATION OF PLUMBERS.

FACTS IN SUPPORT OF THE EXTENSION OF THE EXISTING STATUTE LAW AS TO HOUSE DRAINAGE.*

By ERNEST HART,

Chairman of the National Health Society; Member of the Executive Council of the International Health Exhibition.

I.—INTRODUCTORY.

GENTLEMEN,—It would ill become me, before an assemblage such as this, to arrogate any superior or special knowledge on the 'art and mystery' of proper plumbing. But it has seemed advantageous that one who, from the nature of his work and the bent of his inclinations, has gathered together some experiences of general interest on a matter that affects us all, both professionally and domestically, should offer those experiences for the consideration and discussion of an institution having functions and attributes such as yours. In what follows, I shall not attempt to indicate in detail the sanitary defects from which our houses and their inhabitants suffer. It must suffice for me to draw your attention in general terms to the undoubted evils which accompany bad plumbing and imperfect drainage, and to indicate what, in my judgment, appear to be the only effectual remedies.

It is not by any means an exaggeration to say that hardly a week passes without some mischief caused by bad drainage being brought under my notice. Epidemics caused by sewer-gas occur and recur, but their warning is not heeded. People are vaguely conscious when they get a strong whiff of sewer-gas in their houses, that there is 'something wrong with the drains,' but it does not occur to them that there is any need for action on their part until one of their household is struck down with typhoid fever or diphtheria. It is not till then that the health-officers or sanitary architect is called in, to find, it may be, that the inmates of the house have been practically living for a considerable period over a cesspool.

The effects of sewer-gas manifest themselves in many occult ways other than an explosion of actual disease. A convalescence is retarded; ordinary disorders take on more acute phases, surgical operations heal slowly and badly, the household is generally out of health, and below par. A diligent search in the basement would probably reveal the cause of all this. I shall hardly need, before an assemblage like the present, to argue that drains ought not to be improperly constructed, improperly laid, or improperly connected with the sewers. Let me endeavour to be constructive as well as destructive, and to indicate what, in my opinion, may best be done by legislation to keep from our thresholds the arch and subtle enemy of sewer-poison.

It would be foreign to my present purpose to discuss at all the various traps and other contrivances for preventing the access of sewers-gas to our houses that are so much paraded before the public. The cardinal principle is, of course, to break the connection between the air of the house-drains and the air of the sewers. Anything that interferes with this, or sets itself up in substitution for it, is a delusion and a snare. I shall presently

* Read at the Plumbers' Conference at the International Health Exhibition, Oct. 20, 1884.

explain, so far as appears necessary or the true system of house-drainage; but it is best that, as in everything else, it is the way the system is practically carried out that is the important thing of all. Hence we are brought to the problem which I have set myself to solve—the best means of providing for the regular registration of plumbing in houses.

—EXISTING LAW ON THE SUBJECT.

It must be confessed that on this subject of house-drainage our existing statute law, both in the country and in the metropolis, is very insufficient and unsatisfactory.

England Generally.—Under the Public Health Act, 1875, a house is without a drain sufficient for drainage, the local authority must, by notice, require the owner or occupier to have a covered drain emptying into any sewer not more than 100 feet from the site of such house; or if there be no such sewer, then into a covered cess-pit or other place not being under any house, as the local authority may direct. Such drain or cess-pit must be of such materials and size, and to be at such level, and with such fall, as on the report of their surveyor the local authority may require. If such notice is not complied with, the local authority may, after the expiration of the time specified in the notice, do the work themselves, and may recover in a summary manner the expenses incurred by them in so doing from the owner or may, by order, declare the same to be improvement expenses (sect. 23). This applies both to urban and rural sanitary districts.

It is unlawful in any urban district newly to erect a house, or to rebuild any house, which has been pulled down or to or below the ground-floor, or to pull down any house so newly erected and built, unless a covered drain or drains be constructed, of such size and materials and at such level and with such fall as on the report of the surveyor may require. In the urban authority 'to be necessary for the proper drainage of such house. Such drains must be to empty into any sewer which is not more than 100 feet of the house; or if there be no such sewer, then into a covered cess-pit or other place not being under any house, as the local authority may direct. Contravention of this section involves a fine of 50*l.* It will be noticed that this requirement does not extend to rural districts unless the local authorities have been invested with urban powers which are often not applied for until a number of new houses have been erected on the most insanitary principles.

The urban authority (including, of course, rural sanitary districts invested with urban powers) may make with respect *inter alia* to the drainage of buildings (sect. 157). The owner and occupier of a building is entitled to cause his drains to empty into sewers of the local authority on condition of giving due notice and of complying with the regulations of the authority in respect of the mode in which the communications between such drains and sewers are to be made, and subject to the control of

any person who may be appointed by the authority to superintend the making of such communications (sect. 21). The definition of nuisance given in sect. 91 of the Act includes 'any drain so foul or in such a state as to be a nuisance or injurious to health,' for the abatement of which the proceedings specified in the subsequent clauses of the Act may be taken. Every local authority must provide that all drains, water-closets, earth-closets, ash-pits, and cesspools, within their district be constructed and kept so as not to be a nuisance or injurious to health (sect. 40). On the written application of any person to a local authority, stating that any drain, water-closet, &c., on or belonging to any premises within their district is a nuisance or injurious to health (but not otherwise), the local authority may by writing empower their surveyor or inspector of nuisances, after twenty-four hours' written notice to the occupier, or in case of emergency without notice, to enter such premises and cause the ground to be opened, and examine such drain. If the drain on examination appears to be in bad condition, or to require alteration or amendment, the local authority is forthwith to give notice in writing to the owner and occupier, requiring him forthwith or within a reasonable time to be specified to do the necessary works. Non-compliance with the notice is punishable by a penalty of ten shillings for every day of default, and the local authority may, if they think fit, execute such works, and may recover the expenses of so doing from the owner (sect. 41).

The obvious object of all these clauses is the repression of nuisance from drains where it has arisen. But for the prevention of disease by ensuring proper workmanship in the first instance there is practically no effective legislation whatever.

Powers under By-Laws.—The by-laws which individual local authorities propose for ensuring proper and adequate drainage of buildings vary of course according to local circumstances (and, it may be added, prejudices). But inasmuch as all these by-laws have to be approved by the Local Government Board, it may fairly be assumed that the model lines prepared by that Board—to which they have shown a great disposition to adhere—represent all the regulations that are likely to be put in force anywhere. These regulations require that the drains shall be of proper size, materials, fall, and position, that they shall be embedded in concrete, ventilated at each end, and that the inlets shall be trapped. The drains must be trapped from the sewer, there must be no right-angled junctions, and at least two untrapped openings as near the lower and upper extremities of the drains as practicable must be provided.

Under the Model By-laws, every person who intends to erect a new building must send in complete plans and sections of every floor of such building, together with a description of the intended mode of drainage, and a block plan showing the intended lines of drainage and the intended size, depth, and inclination of each drain, and the details of the arrangement proposed to be adopted for the ventilation of the drains. Before covering up any drain the builder must send a notice to the surveyor of the date when the drain will be covered up. If he neglects to give such notice (and in that case only) the surveyor may have the work cut into, or laid open, or pulled down if he cannot otherwise ascertain on inspection whether the by-laws have been contravened. The surveyor is to have free

is defined by sect. A of the Public Health Act to mean of and used for the drainage of one building only, or present the same curtilage, and made merely for the purpose of emptying therefrom with a cesspool or other like receptacle for the drainage of two or more premises occupied by different persons is conveyed. The same definition is given in sect. 250 of the Metropolitan Act, 1855.

access to the work at all reasonable times for the purpose of inspection during construction, and also within a period of seven days after the completion of the building. But the surveyor cannot claim to render the occupation of a new building conditional upon his certificate as to the structural and sanitary fitness of the premises. And, generally, it must be borne in mind that these by-laws are not of universal application. The local authority have first to be convinced that by-laws are necessary, then to discuss with the Local Government Board the details of their proposals, and, finally, when at length they have the power of regulating new buildings, have to make up their minds to enforce such power. Very many sanitary districts in the country have still no building by-laws at all, and the jerry builder has therefore ample opportunity throughout the kingdom for his malevolent enterprise.

(b) *Metropolis*.—In the metropolis a little more is regulated by Act of Parliament, but there are no by-laws in force which impose the useful regulations contained in the Model By-laws of the Local Government Board. Thus sect. 73 of the Metropolis Management Act, 1855, makes obligatory the provision of proper drains to every house required by section 23 of the Public Health Act of 1875, but goes a little more into detail, and provides that it shall be lawful for the vestry or district Board of Works to 'cause the said works to be inspected while in progress, and from time to time during their execution to order such reasonable alterations therein, additions thereto, and abandonment of part or parts thereof, as may to the vestry or Board and their officers appear, on the fuller knowledge afforded by the opening of the ground, requisite to secure the complete and perfect working of such works.' Sect. 75 of the same Act prohibits the erection of a new house unless a proper drain be provided; and sect. 76, as amended by sect. 63 of the Metropolis Management Act, 1862, requires that seven days' notice to the authority must be given of the intention to lay or dig out the foundation of a new house or to make any drain under a penalty of 5*l.* and 2*l.* a day. Every such foundation must be laid at such level as will permit the drainage of such house in compliance with the Act, and every drain must be made in the 'direction, manner, form, of the materials and workmanship, and with such branches, &c., as the vestry shall order, and every such drain shall be under the survey and control of the authority.' Sect. 82 gives the authority power of inspection of drains at all reasonable times in the daytime, and power to open the ground in any place they think fit. Improperly making or altering drains is punishable by sect. 83 by a penalty of 10*l.*, and if matters are not remedied within fourteen days, the local authority may do the necessary work and charge it to the person offending. Drains found in bad order or condition, or requiring cleaning, alteration, or amendment, must by sect. 85 be put into proper condition within a specified time, failing which the vestry may execute the necessary work.

Thus it will be seen that in many respects the metropolitan law is inferior to the law for the provinces. There is no authority which can enforce the enactment and practical carrying out of adequate by-laws; the Metropolitan Board of Works, which can control the foundations and the stability of buildings, has no power over their drainage; but all

is left to be regulated by the local vestries attempt at any sort of consistency or supervision. Hence it is not surprising that the state of house-drainage of the metropolis should be so scandalous as it is admitted on all hands to be by one who takes a walk through any of our suburbs, and who contemplates the flimsy structures that are being run up on all sides, cannot be impressed with the store of mischief that is being laid up for the next generation, if not for the present, through the absence of effectual regulations for the control of building and drainage operations.

III. UNIVERSALITY OF BAD DRAINAGE

This somewhat tedious exposition of the law has been a necessary preliminary to a discussion of the alterations and additions which are to be made in it for the complete protection of the householder. I shall not here enter at all into the respective merits and demerits of the various systems of house-drainage, nor into the merits of the multitudinous traps and other contrivances which are so much belauded by their inventors; but I will insist upon, and endeavour to show the necessity of, stringent regulations designed with the object of insuring that no drainage work is done except by properly instructed and skilled plumbers, and further, that each stage of such work is systematically and thoroughly inspected by an official representative of the local authority, who shall test the efficiency of the drains before allowing them to be covered, and whose certificate shall be essential before a house can be occupied.

Sanitary Condition of Private Dwellings in Rogers Field, than whom no greater authority exists, recently summed up the principles governing house drainage as follows:

1. All refuse matter must be completely and rapidly removed from the house.
2. There must never be any passage of air from the drains or waste-pipes into the house.
3. There must be no direct connection between the drains and the water-supply. These, although so simple, are so frequently neglected. The first goes absolutely to the root of sanitation, for were it strictly complied with there would be no leaky drains, no polluted drains, and no production of foul gases in the drains from decomposing organic matter.* The number of houses fulfilling the conditions described in Rogers Field is surprisingly small. Mr. Field himself said at a recent discussion that 'from my experience of eight or ten years in these houses he found that the majority of houses were defective, and out of about a thousand examined he had only found three that were perfect.' The resident engineer of the London Sanitary Association, stated last January† that of the houses inspected by his Association, total disconnection or stoppage of the drains had been discovered in 6 per cent., leaky soil-pipes in 31 per cent., disconnection of the sinks, baths, or fixed basins, in 10 per cent., drain or soil-pipe in 68 per cent., and direct communication between the drinking-water cistern and the drain or soil-pipes in 37 per cent. From 100 country houses inspected by the Edinburgh Sanitary Inspection Association, 90 per cent. had their drains in direct communication with the exterior; 80 per cent. had faulty water storage

* SANITARY RECORD, Vol. xiv., p. 249.

† *Ibid.*, Vol. xiv., p. 313.

‡ *Ibid.*, pp. 1

its; and no less than 15 per cent. had the main drains in direct connection with cesspools. And a every-day experience it is impossible to doubt: the number of houses that can be regarded as: from the irruption of sewer-air is very small indeed. Our public buildings, where economy not be pleaded as an excuse, do not set us the example they ought. The imperfect sanitary condition of the War Office, of Somerset House, and of the Local Government Board and of other Government offices, has at various times monopolised a large share of public attention, and we hear too much of public buildings, hospitals, asylums, and the like, being rendered unbearably offensive and even dangerous to life through the imperfect state of their drainage arrangements.

—NATURE AND EXTENT OF MISCHIEF CAUSED BY BAD DRAINAGE.

Although no sanitary evil has been more abundantly demonstrated than defective drainage, it is unfortunately possible to adduce any statistical evidence of the mischief which it causes. For when individual members of particular households are sickened down by illness arising from this cause, it is dom that the mischief is known outside the victim's own circle, unless he or she chance to be a person of importance. The Prince of Wales's illness in the winter of 1870, the Duchess of Connaught's recent experience at Bagshot House, have air counterparts by hundreds; but the public does not know of them except by accident. It is only when fever-poison gets distributed wholesale through rough sewers, and obtains access to the interior of houses through imperfect house-drains that the evil is seen in its true light. The number of deaths which drain-air is an existing or a contributory cause is not ascertainable from the Registrar-General's returns; but if we bear in mind that sewer emanations and polluted waters are the two chief agents in the production of typhoid fever we may, without fear of contradiction, assess the annual number of victims to drain-air almost by thousands. The evil with which we have to cope is, therefore, one of very general and pressing importance.

V.—RECOMMENDATIONS FOR STRENGTHENING THE LAW.

Imperfect Recognition of Danger of Communication of House-Drains and Sewers.—Amongst those more immediately concerned in the erection of buildings there seems to be a very imperfect recognition of the danger involved by the direct communication of the sewers with water-closets, sinks, cisterns, baths, and the like in the interior of the houses. And, in regard of construction, almost unlimited trust has been placed in artisans, who not only can hardly be expected to understand certain of the first conditions (as to atmospheric pressure) which they have to meet, but who also in not a few instances have evidently failed to apprehend that even their mechanical work requires conscientious execution. Under influence of the latter deficiency there have been left in innumerable cases all sorts of escape holes for sewer effluvia into houses, and disjunct drains effusing their filth into basements; while under the other deficiency, house-drainage, though done with good workmanlike intention, has often, for want of skilled guidance, been left entirely without exterior ventilation, and sometimes has in

addition had the overflow-pipes of baths or cisterns acting as sewer-ventilators into the house; and all this not unfrequently in places where the sewer itself, from which so much air has been wasted, has been an ill-conditioned and unventilated sort of cesspool.*

Thus, the two great evils to be guarded against are (1) *improper systems* and (2) *imperfect workmanship*. The first can only be guarded against by the definite prohibition by Act of Parliament of all such improper appliances as D-traps, containers of the like, and by insisting upon the disconnection of the air of the sewers from that of the drains. The second can only be prevented by the systematic instruction of plumbers in their craft, by imposing the necessity of a licence on all plumbers, and by adequate independent inspection of all drainage work before it is covered up and lost to the view. It is unnecessary for me, before such an audience as this, to go minutely into the quality, material, or other details of the system of drainage to be adopted. It will suffice to state certain broad general principles, the reasonableness and necessity of which will, I think, be readily admitted.

Systematic Instruction of Plumbers.—The systematic instruction of plumbers in their craft is no doubt a matter outside the Legislature. But much may be done by the delivery of lectures, such as the admirable series recently given by Mr. Stevens Hellyer, under the auspices of the National Health Society, and now published in a separate and attractive form.† The interest, and even enthusiasm, with which these lectures were attended by working plumbers is, I hope, a fair augury of better things in the future. The City Guild of Plumbers, which has recently shown signs of awakening life, might, moreover, do much to encourage good and discourage bad work by instituting a School of Plumbing, with the needful accessories and workrooms, as well as by the exercise of its influence upon the trade.

And if I may venture a suggestion to architects as a body, I would advise that in their specifications they should be more definite as to the nature of the appliances ordered, and should exercise supervision over these being properly situated and connected. I trust I shall not be unduly touching upon the ethics of the profession when I remark upon the immense advantage which accrues from the architect insisting upon personally testing and examining the pipes and drains of any house which he has designed before they are covered up and lost to view. If every architect did this as part of his professional concern for the house, we should hear much less often of death and disease caused by drain-air.

Turning now to the question of the strengthening of our statute law as to drainage and plumbing, I think that in any new Act the following points should be provided for:—

First as regards *drainage itself*:—

1. Rural authorities should have the same powers as are now possessed by urban authorities. In the suburbs of towns, just outside the municipal boundaries, thousands of houses are springing up without any sanitary supervision whatever. The rural authority is, perhaps, unaware of the evil, or is, at any rate, careless about it, until the houses are erected; and their opportunity of making by-laws which can control such houses is then lost.

* Simon, 'Report on Filth Disease,' p. 23.

† 'Lectures on the Science and Art of Sanitary Plumbing,' by S. Stevens Hellyer. B. T. Batsford.

2. It would be well that the requirements of the Model By-Laws as to New Buildings issued by the Local Government Board should be incorporated in a Building Act, which should be forthwith passed, and be of general application throughout the country.

3. The plumbing and drainage of all buildings, public and private, should be executed in accordance with plans and specifications previously approved in writing by the local authority.

4. No drainage-work should be allowed to be covered or concealed in any way until it had been examined and passed by the surveyor.

4A. The efficiency of all drains should be tested by the peppermint or some other test before they are passed; and it should be a rule that, wherever possible, drain-pipes should be kept from view only by boarding which can be readily removed.

5. No new house should be allowed to be inhabited until it had been passed and certified by the surveyor, and a plan of the system of drainage should be appended in every case to the lease or other document for the letting of the house.

As regards the *plumbers*, I suggest that—

6. The names and addresses of all plumbers should be registered by the local authority, and no plumber should be able to carry on his trade until he had been so registered, and had received a licence from the local authority.

7. Before the licence is granted to him the plumber should attend personally at the office of the local authority, for examination as to his qualification as a plumber.

8. Such licences should be renewed from year to year, and their continuance should depend upon the good behaviour of, and the return of the work done by, the licensee.

9. The names of all licensed plumbers should be publicly advertised once a year by the local authority.

VI.—STATE OF THE QUESTION IN AMERICA.

If it be contended that the enforcement of such regulations as these would harass a particular calling, and be an unwarrantable interference with trade, my answer is a reference to the enormous evils which arise from imperfect drainage, and an appeal to what is now taking place on the other side of the Atlantic. In the United States—the 'land of the free'—the plumber is being sternly circumscribed in his powers of mischief. All the more important towns are taking powers for the registration of plumbers and the regulation of plumbers' work, and I cannot do better than cite in conclusion what has been done in this regard.

The State of Illinois claims to have been the first to have passed a law for the regulation of plumbers, though it would appear that the subject had for some time before the Illinois Act was passed been under consideration at New York.* The effect of the Illinois law, which was passed on May 30, 1881, was to make compulsory the sending in to the Health Commissioner and approval by him of the plans of all new buildings, and to prohibit any plumbing work being covered up until approved by the Commissioner under a penalty of 100 dollars. It will be observed, however, that no provision is made here for the registration or licensing of

plumbers. Chicago promptly took advantage of the law with the best results.

New York has passed a law in the spring (and which is applicable to New York and Brooklyn), making the registration of plumbers compulsory, and providing for the supervision of plumbing and drainage generally. Every master and man plumber must register his name and address with the Health Department of the city, and no man may carry on the trade of plumbing unless he is registered. A list of the registered plumbers must be published once a year. No building erected the plan of which has not previously been approved by the Board of Health; and drawings must also be submitted and deposited with the Health Department, and everything which relates to the plumbing and drainage of the house. Before the drains are covered up notice must be sent to the Health Department by the owner or plumber, that the work may be examined, and the Health Department will not approve or permit a drain to be covered up until it has been examined by one of its inspectors and found to be properly constructed.*

The Boston regulations, passed on June 1, 1882, are very full and complete. They are given *in extenso* in the SANITARY RECORD for last (p. 305), but I subjoin the regulations as to the steps to be taken by the Board of Health before a person may carry on the business of plumber. Every person who has not first registered his name and address with the office of the Inspector of Buildings. Every person is required, before constructing new work or repairing old work (except repairing leaks), to file at the office of the Inspector of Buildings a notice of the work to be performed, and if the approval of the Inspector cannot be obtained, the plumber is deterred from doing the work. Every house or building separately and independently connected with a public sewer. No pipes or other fixtures covered or concealed in any way. The work to be covered until examination by the Inspector has taken place. The peppermint test is required if the work does not stand the test, all water turned off from the building, and not let until the plumbing has been pronounced satisfactory by the Inspector. Violations of the Ordinance are visited with penalties ranging from 20 dollars.

At San Francisco there is a Board of Examiners who examine all applicants for registration as master or journeymen-plumbers, and on recommendation issue certificates of registration. Candidates for master-plumbers undergo a theoretical examination as to the principles of plumbing, and candidates for journeymen-plumbers an examination as to the practical part of the trade.† At Washington no plumbing work of any house—which is subject to strict regulations as regards materials—may be covered or in any manner hidden from view until after inspection and approval by the Inspector of Buildings. The pipes are to be tested with water. The police are instructed to arrest any one found making an excavation in the street or making any sewer connection without permission.

Other large towns are waking up to their responsibility in this matter. Baltimore

* See SANITARY RECORD, March 15, 1881, p. 345; and May 15, 1881, p. 438.

* SANITARY RECORD, vol. xiii, p. 55; and vol. iv, p. 1.

† *Ibid.*, vol. xix, p. 559.

just (October 1883) passed an ordinance providing for the appointment of an inspector of plumbing, and forbidding any plumbing work without a permit under penalty of 5 dols. Washington has also appointed an inspector of plumbing, after a four years' struggle by the medical officer of health. A very elaborate code has been drawn up for Philadelphia, but is not yet in force. They are much of the same character as those in force for New York, and need not therefore be further described.

I think these facts are a sufficient answer to possible objectors as to the character of my proposed regulations; and in any case I feel confident of your support in my contention that our building laws need thorough amendment and reconstruction.

VENTILATION OF THE OFFICES OF THE 'DAILY TELEGRAPH.'—In the compositors' room of this establishment 170 men work throughout the night, and 70 argand burners light the desks. The complaints of the men and their sufferings were very great. The proprietors, desirous of remedying this state of things, under the advice and direction of Messrs. Arding, Bond, and Buzzard, have put a new and lofty roof, which is covered by a lantern along its whole length, the windows on both sides of the lantern opening in two divisions by lever bars at each end of the room; this provides an ample outlet for the vitiated air in summer time or in calm, moderate weather, when open windows are unobjectionable. Fresh, purified air, either cold or warm, is driven in by a 16-inch Æolus waterspray ventilator fixed in the basement. In warm weather this cool, fresh air is used to keep down the temperature to an agreeable point, while in winter the fresh air can be raised in a few minutes to a temperature of 100° by simply lighting the gas burners around the tubes through which the fresh air passes. Thus a continual supply of fresh air, equal to five times the cubical contents of the room, is afforded every hour, and of a temperature adapted to the sensitiveness of men engaged in sedentary occupation. Returning to the subject of extraction, when the weather is such as to render open windows undesirable, and in this climate of ours such an objection certainly obtains during eight months out of the twelve, the vitiated air is drawn off by two 16-inch Æolus waterspray ventilators, which have their communication with the composing room through two panels, occupying the position of two of the side lights of the lantern. These are continued by 16-inch galvanised shafts *outside* the roof, entering the composing room through the roof by the plate, and descending through all the floors into the basement. In each of the last 6-foot lengths of these shafts a waterspray is fixed; by simply turning a tap a powerful exhaust is immediately set up, dragging down the vitiated air from the composing room into the base. Thus a continual change of atmosphere is ensured for the composing room, although the doors and windows be tightly closed. Another peculiarity in this application of the waterspray as an exhaust is the fact of the upper part of the shafts falling down the slope of the roof being exposed to the action of the cold atmosphere outside; this instantly condenses the carbonic acid held in suspension in the heated air, which by its own gravity assists the downward current. Thus condensation, a feature which in automatic exhaust ventilation is always found to be an obstacle and a drawback, is here impressed into the service of the cause. A large portion of the vitiated air drawn off by the Æolus from the composing room is condensed and absorbed by the sprays and passed off with the waste water. The residuum, which is almost wholly pure air, passes through the shaft room into the engine room, which is again emptied by another exhaust Æolus, discharging into the courtyard.

The Worshipful Company of Founders have granted a donation of five guineas to the National Health Society, 44 Berners Street, W., for the Diffusion of Sanitary Knowledge.

FIGURES, FACTS, AND FALLACIES.

By EDWARD F. WILLOUGHBY,

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VITAL statistics form so large and so valuable a part of the literature of public health that it is of the utmost importance that the principles and practice of the science should be well understood. It has been said that figures may be made to prove anything, and so they may if ignorantly or dishonestly handled; but since the effects of social or material agencies acting slowly on large masses of people can only be appreciated by their results as shown by vital statistics, a knowledge of the fallacies incident to such conclusions is absolutely necessary for the avoidance of erroneous inferences.

This may seem a truism, but partly from the absence of any text-book on the subject and the scanty treatment it has hitherto received in works of a general character, and partly from the idea that figures speak for themselves, some of the fallacies we are about to expose are constantly met with, not only in society and general literature, but, where we should least expect them, in the reports of medical officers of health, and thus either mistaken notions are perpetuated, or the true indications are lost sight of, and the science itself is discredited.

Of course the great storehouse of facts and figures is the office of the Registrar-General, whence are issued the reports of the census, which is taken once in every ten years (too long an interval), and weekly reports of births, deaths, and marriages, as well as quarterly and yearly summaries and a valuable decennial retrospect, in which the lessons and results of the preceding period are discussed.

Birth, death, and marriage rates are calculated on the population per 1,000, or for some purposes per 10,000. The actual population is known only by the census, but for the intervening years what are called corrected estimates are made use of. These are obtained in one of two ways, or by a combination of the two. One is that of assuming that the population continues to increase at the same rate as it did in the preceding decennium; the other is to ascertain by the last census the average number of persons 'in each house' and to assume that the same density is maintained in the following years, the number of inhabited houses being always known from the books of the rate collectors. Both methods are obviously open to error, for a population may increase rapidly through the rise of a new industry or watering-place, and then remain stationary or even decline, and the new houses may be of a better or lower class than the older ones, and therefore have a different number of occupants.

Fallacies of Estimated Population.—In 1871 it was found that the population of Gosport had been over-estimated by 33 per cent., and that of Cambridge under-estimated by 16 per cent., consequently the former had appeared healthier and the latter unhealthy than it really was, the death-rates differing not by 12 per cent., as had been imagined, but by 0.2 per cent. only.

If the assumed population differ from the true one by no more than 10 per cent., an assumed death-rate of 24 per 1,000 will represent one of 21.6 or of 26.4, as the case may be.

Fallacies of Registration.—All deaths (except those of infants under a week old, who are often reported incorrectly as stillborn, and therefore in

this country are not registered) are registered, but a large number of births escape registration either from negligence, shame of illegitimacy, or for the purpose of avoiding vaccination.

Fallacies as to Causes of Death.—In many parts of the country a large proportion, in the mining districts of Wales and Durham as high as 10 to 14 per cent. of the causes of death are entered by the registrar on the evidence of the friends, or are suggested by himself in the absence of any medical certificate. Thus the apparent prevalence of 'consumption' in Wales is partly due to all lingering diseases being so-called by the ignorant people. Even medical certificates are very often inaccurate, either from faulty diagnosis or from the patients having been attended by unqualified assistants, or, as is not unfrequently the case in rural districts, seen by the medical man only once before death.

Definition of terms employed.

Mean age at death	} =	Sum of ages at death
		Number of deaths.
Mean age of living	} =	Sum of ages at census
		Number of persons living.
Mean duration of life	} =	Number of population
life		Number of deaths in a year.

Probable duration of life, or expectation at birth = age at which a number, say a million born, is reduced to one-half.

This is not the same as the mean age at death, for in two communities 1 in 40 may die annually, *i.e.* 25 per 1,000, but in one the deaths may be mostly those of infants, the adults reaching a good old age, in the other few may attain a great age but the infant mortality may be low.

Natural increase = excess of births over deaths.

Fallacy of Duration of Life.—The rule given for finding the mean duration of life holds good only of the rare case of a stationary population, *i.e.* one in which the births just balance the deaths. Thus, with our present mean birth-rate of 35 per 1,000, Dr. Richardson's Utopian death-rate of 4 or 5 per 1,000 in Hygeiopolis would imply a mean duration of life of 65 years and not as would at first sight appear of 200 or 250 years.

The probable duration of life or expectation is obtained from life-tables which profess to show how many of a million born die every year, until all are extinct. They should be made by watching a generation throughout its existence, but they would then be out of date, since the conditions under which these persons passed their later years might be more or less favourable than those of their youth. Actually and probably they are made more correctly by observing for a period of ten or twenty years the ages of all persons at death, and assuming the results to be applicable to the whole lifetime of each. Some, of course, were born, and passed many years under better or worse conditions, and the same will be the case with the rising generation; but the error is greatly reduced, and life-tables frequently checked and corrected are the best guides to the health of a community.

For life assurance an error in the tables giving a duration under the truth is an advantage, but the aim of the sanitarian is to falsify all tables.

Dr. Rumsey proposed as a test of healthiness what he called lines of vitality and of mortality, or the mean ages of the living and the dying. In healthy communities the line of mortality is the

higher; in unhealthy, that of vitality. Thus he found in Herefordshire the vitality = 28½ years, mortality = 38½, but in Liverpool vitality = 25, and mortality 17½—*i.e.* in the former people lived longer, in the latter they died early. But immigration disturbs such calculations; even in the rural parts of Surrey 24 per cent. of the population were immigrants.

Birth-rates and Death-rates.—The health of a people lowers the death-rate; prosperity raises the birth-rate, unless voluntary and artificial checks are imposed; but a high birth-rate, may also be due to early and improvident marriages.

Increased length of life implies a decrease of the death-rate, but not necessarily an increase of the population, which depends on the excess of births over the deaths. With a decreased death-rate there will be a larger proportion of adults if the decreased death-rate be mainly among children, or of the aged if among adults.

The death-rate is dependent on the sanitary condition of a community, and is thus under legislative control.

The birth-rate depends greatly on voluntary marriage and the fertility of females—*i.e.* on the action of individuals rather than on that of the State. It is strikingly connected with the demand for labour, with emigration, and with any need for men to fill the vacancies caused by death. Thus, after wars and pestilences a population increases rapidly, young men filling the places of the deceased and marrying thereon. Rising industries, in like manner, lead to numerous marriages and propagation. The birth-rate depends on the constitution of the population, chiefly as affected by employments; the death-rate on its constitution as regards ages and sanitary conditions.

A large proportion of aged persons by no means implies longevity, but depends on the proportion of children to adults—*i.e.* on the size of families. Thus there is a larger percentage of persons over sixty years in France than in England, not because life is longer there, but because fewer children follow each marriage; and the natural increase of the population is consequently less. The teeming populations of Liverpool and Manchester, amid insanitary surroundings and unfavourable social conditions, have the highest birth-rate; but also the highest death-rate, and are only maintained or increased by immigration.

The death-rate varies almost directly as the density of the population—not, that is to say, in consequence of mere aggregation, but from the social and moral conditions causing and caused by overcrowding, poverty, and vice. A high degree of aggregation is in itself quite compatible with a low death-rate, as in the improved industrial dwellings where one thousand persons or more are comfortably housed on an acre.

Fallacies concerning the Relations of the Birth-rate and Death-rate.—It is often said that a high birth-rate involves a high death-rate, the latter constituting a sort of natural check on the former. Of course infancy is more tender than manhood, and where there is a large infant population there will necessarily be more deaths than where children are few. But if the high birth-rate be the natural and direct result of prosperity and of high wages, as in industries where only adult males are employed or in flourishing colonies, the birth-rate will greatly exceed the death-rate, the sanitary conditions being good.

on the other hand, the high birth-rate be-
lt of general illegitimacy, of improvident
s, &c., the consequences will be a propor-
high death-rate and a teeming but short-
ulation.

tion of Infant and Child Mortality.—It is
calculate the deaths of infants, &c., on the
ths at all ages, or on the number of persons
But since the proportion of children to adults
population can be known only at the time of
is, and is very different in different places,
estimates are useless, and for purposes of
on most fallacious.

fant mortality should always be calculated
fant population, and so with any particular
life for which the data are to be had.
it population in any given year is the mean
rths in that and the preceding year.

ncusions to be drawn from the infant mor-
any community are among the most im-
uties devolving on the sanitary reformer,
ng as the infant death-rate is calculated as it
vast majority of medical officers, &c., nothing
ision can follow. The number of children
e years may be approximately obtained by
ving method, which is, we believe, original.
ether the total births of the five previous
deduct from the sum the number of deaths
e year of age in the first of these years,
o in the second, and so on. The remainder
e number now living under five. Errors
om emigration and immigration may gene-
ent to correct one another.

Mortality from all causes per 1,000 Births.

	1871-83	1881
.....	148	130
.....	156	148
.....	199	173
.....	178	161
.....	182	163
.....	200	205
.....	172	149
.....	141	121

*per 100 in Infancy (under 1 year) and Childhood
(5 years) in several Countries of Europe.*

	Under 1 year.	Under 5 years.
ds	8'6	12'2
.....	29'5	—
66-74)	10'6	18 0
3-75).....	16'9	24'9
6-74).....	21'8	33'4
77).....	22	35'5
west—Hanover, Schleswig- and Westphalia.....	15	—
ghent—Bavaria (1865-77)...	31'8	39'8

uestion of infant mortality is closely con-
ith that of infant feeding, and these ex-
y differences are mainly if not wholly
e in this way. In the Faroe Islands and in
infants are invariably breast-fed, while in
nd among the working-classes in Bavaria
as constantly brought up on sopped bread
aceous foods. It is a fact full of instruc-
when during the sufferings and starvation
y the siege of Paris the general mortality
lation was doubled, that of the infants was
by 40 per cent. simply from the mothers
mpelled to suckle their babies, and the

same increase of the adult and diminution of the
infant mortality was observed during the Lancashire
cotton famine when the mothers were no longer at
work in the mills.

When improper feeding is the chief factor, a large
proportion of the deaths are due to diarrhoea and
other diseases of the digestive organs, convulsions,
&c., and relatively fewer to other causes of a less
preventable kind.

*Fallacious Inferences from Neglect of the Factor of
Age.*—Since of the 20 deaths per 1,000 living in
this country 8 on an average are those of children
under 5 years, 8 of persons between 5 and 65 years,
and 4 of still older persons, or 40, 40, and 20 per
cent. respectively of the deaths are contributed by
these age classes; and since infancy and childhood
are more susceptible to insanitary influences, it is
obvious that the general mortality will be greatly
affected by the relative proportion of children and
adults. Indeed, Dr. Rumsey showed that the dif-
ference of 10'5 per 1,000 in the death-rates of Dr.
Farre's 60 healthiest and 30 unhealthiest districts
was thus explained to the extent of 8 per 1,000,
depending on the number of children and the greater
or less mortality among them.

We may here refer to a notion which has
fascinated some minds fond of paradox, and which
we may call the *fallacy of the substitution of
diseases*. It has been said that the reduction of
one cause of death leads to an increase of others.
In one sense this is true, since everyone must die
at some time from some cause or other; but the
success of sanitary measures is seen in the re-
duction of deaths from preventable causes. But
the fallacy referred to consists in ignoring the in-
fluence of mean age on the prevalent diseases. Thus
of 1,000 persons dying from all causes in 1861 to
1871, there died of:

	Scarlatina.	Consumption.	Cancer.
In the healthy districts....	2'4	108'5	27'5
In Liverpool.....	38'3	96'6	9'9

These are diseases respectively of early, middle, and
advanced life. It is not that there was less phthisis
or cancer in Liverpool, but so many persons died in
youth that fewer attained the age at which they
became liable to those diseases. Thus, an increase
in the deaths from diseases incident to advanced life
may really indicate a general prolongation of life
from improvement in the public health.

THE ATKINS FILTER AND ENGINEERING COMPANY,
LIMITED, have received an order from Her Majesty's
War Office for 40,032 lbs. of their specially prepared
Granulated Charcoal, to be used in the 'Atkins's' Filters
recently supplied by them for use in the Military Barracks
and Hospitals, &c.

WE are glad to note that the City Engineer of Liverpool,
Clement Dunscombe, Esq., M.A., M.Inst.C.E., has been
awarded by the Jury Commission at the International
Health Exhibition a Gold Medal for his designs for
Artisans' and Labourers' Dwellings, and the Corporation
of Liverpool have been awarded a Diploma of Honour
for the exhibit. These designs embrace the Nash Grove
Dwellings now being erected by the Corporation under
Mr. Dunscombe's supervision, at a cost of £53,000,
exclusive of the value of the site. Descriptions of these
dwellings will be found in the SANITARY RECORD for
Dec. 15, 1883, p. 291, and March 15, 1884, p. 437.

SANITARY PROGRESS AND APPRECIATION.

By HENRY M. MAVOR.

IT may be safely affirmed that in regard to general sanitation we are wise in our generation, but it must also be admitted that the present generation in the earlier years approached the subject somewhat tardily; and, furthermore, while recognising the many evils to be combated, the general public treated the danger somewhat disrespectfully, and took but few steps to ascertain causes when effects were only too palpable and fatal. In many cases of indisposition and sore throat or other pertinent ailments, 'change of air' was and is rightly insisted on, but frequently in ignorance that the 'air' which naturally was not 'suitable' contained a considerable quantity of sewer gas. It was only in the event of severe illness or fatal results that the question of drainage was taken into consideration, and this is not to be greatly wondered at, as no general attention had been called to the subject, and, owing to this want of knowledge, it was a first experience from a householder's point of view, and as such was, as a rule, dearly purchased. The sanitary surveyor, or engineer, as we understand him now, was not in existence, and the warning voice was raised by the doctor. The cause being thus discovered, the inefficient services of the plumber or builder were called into requisition, and a general patching up of drains, with the addition of a trap here and there, mended matters more or less for a time, until the still present defects that were manifest were made manifest to the occupier. In a commercial age this want of knowledge of construction soon found the correlative supply, and being a fresh field for energy and ingenuity, there was no lack of competitors to undertake the work and meet the requirements in a practical and scientific manner. Still, the public attention or appreciation somewhat flagged, except under exceptional circumstances, and it is but comparatively recently that a sense of the great importance of the question seized upon the minds of the multitude, and for the past few years a growing disposition has been evinced to at any rate take an interest in and understand the rudiments of sanitation, so far as it pertains to the immediate surroundings of the people. This advancing interest led up to and has been greatly fostered by the well considered Exhibition at South Kensington, and the lessons to be there acquired have penetrated far and wide. Many of the mysteries which were supposed to surround this study have become gradually dispelled, and it is seen that common-sense principles are brought to bear upon ordinary physical facts, and the laws of nature are enlisted in the service and not set at defiance, as was formerly the case.

But if, on the other hand, we turn to see what our neighbours are doing we find a state of things which is pre-eminently unsatisfactory. The prevalence of cholera on the continent, with such terrible results, is a strong commentary upon the gross state of ignorance, and, one might also say, wilful negligence, of the commonest forms of precaution or cleanliness. Those who have had experience in foreign hotels or houses can bear out this statement, and the indifference with which such affairs in normal times are treated is a matter of surprise and horror, not unmingled with disgust,

but which in our security we can but treat with sympathy. To 'see Naples and die' has now a terribly literal meaning. The following extract from a letter quoted in the *Times* emphasises the many sad reports: 'It may easily be imagined that a vast amount of filth has been accumulated century after century by an ever-increasing population. It is only necessary to cut brief trenches in old Naples to find a subsoil black and mephitic, because composed of organic *débris* in slow or active putrefaction. To this be added a most imperfect sewerage system, the walls of which are unprotected, without any fall, without a course of water, often placed under the level of the sea, and one can readily imagine again the putrid exhalations which arise, and which, filtering into the cisterns, poison the drinking water of the city. At present Naples is a disgrace to civilisation and humanity, and, what will come nearer to the feelings of Italians, it is a national danger. When the disease has run its course, and the danger is past, will they, *can* they set their houses in order, and give reasonable sanitation to their city? It is of extreme doubt, if we judge by what has been done before.'

In Paris the present condition is almost as serious; and the predisposing causes of infection are many. Typhoid fever is very rife, and the Seine is a distributing agent of disease, and to the defects of the city drainage may be added a supply of inferior water. We see, however, that it is proposed to institute a municipal sanitary service in Paris, which will take upon itself all the functions usually performed in England by vestries, district boards, commissioners of sewers, the Metropolitan Board of Works, and water-companies, as the management of the water-supply is to be included.

The Spaniards have barely sufficient water for drinking, therefore there is little for washing or drainage purposes. Not that they possess any appreciable system of drainage; but this perhaps is well for them, for the hot dry air sufficiently deodorises and oxidises the products of sewage, and they escape some of the risks of contamination by water.

In Germany but little encouragement comparatively is given to sanitation, although official sanction is given in high quarters to departmental efficiency. To see ourselves as others see us is always more or less amusing, if not instructive; and it will be amusing to many to hear a German professor's view of the International Health Exhibition. He reports to his 'Society' that, from a scientific point of view, it is pitiful, 'it being anything rather than its name implies.' The statement shows anything but a healthy exhibition of judgment, and its very absurdity carries its own refutation. We look in vain through all the foreign sections of the Exhibition for any real improvements in sanitary appliances or methods, and, beyond a few drawings in the French and Belgian Courts, we see no attempt to approach the subject in such a way as to require any serious attention. Perhaps this was all our German friend could find, and this might give rise to his remarkable want of perception. The literal meaning of 'approaching a subject without prejudice' is 'knowing nothing about it: could the professor have been prejudiced or otherwise?

In America, where they have less to unlearn, they are keeping step with us, for, although 'we speak their language so badly,' they are not above exchanging views, nor are we above borrowing from

mutual advantage. The business-like and odd way in which they treat the subject, both in practice and theory, is characteristic, and their agencies and other institutions for spreading practical knowledge are well considered.

Coming to the appreciation of the question at hand, we find necessary attention called from time to time in the columns of the daily papers, and it appears from all sorts and conditions of men, whether with, and some without, a knowledge of what is being written about; but, such as they are, they do not seem to awaken, or, we might almost now say, to excite, the interest in work which has hitherto been, unfortunately, a dead letter with so many.

Well-known London architect, continuing the observations in the *Times*, points out that there is in this respect, especially in London, absolutely no one interested in it to see that the buildings are in perfect order, stronger or better than the *minimum* requirements of Parliament require, and there is no force dealing with the drains and sanitary matters within the house; though elsewhere many are acting as urban authorities under Mr. Cross's regulations issued by-laws relating to these, and will do so if only their inspectors are competent and able to prevent a great many defects which in London we suffer from. This last sentence means a great deal, and Dr. Alfred Carpenter, the chairman of the Council of the Sanitary Institute, replies and states that it is not every local authority which has inspectors of nuisances and local surveyors competent to make the required reports, because many of them themselves are sometimes quite ignorant of the true principles of sanitary science. That one officer recommends, another, without any reason, condemns as utterly inadequate, useless, or even dangerous. If local authorities would employ on their local surveyors and inspectors of nuisances persons having the diploma of the Sanitary Institute of Great Britain, they will be certain of getting officers fully competent to make the reports which are so necessary for the promotion of the health of the inmates of all houses.

The law requires that local authorities should do these matters, but it does not compel them to appoint competent officers. This result may be brought about by public opinion, or may be evoked by the judicious action of the press. Another point referred to is the difficulty which private persons have in deciding which are the best forms of sanitary apparatus and appliances to use, and we are afraid that the ordinary builder, unless he receives a competent opinion, is more puzzled than ever when the various schemes are placed before him. The conclusion of the writer's letter points a moral, and suggests a remedy.

'If persons in this difficulty will visit 74A, Abchurch Lane, which is the home of the Sanitary Institute, as well as the "Parkes Museum," they will find for themselves the different kinds of apparatus and appliances for practical work. They will see the forms which have won prizes and medals at different sanitary exhibitions, and which are sanitariously correct. The door is open to the public free of charge. It is a comment upon the difficulties of sanitary science when we see two bodies like the Parkes Museum (which has been organised for the purpose of educating the people as to what are the best forms of sanitary apparatus) and the Sanitary Institute of Great Britain, whose *raison d'être* is the education of a lower grade of sanitary officials, languishing

for want of funds and popular support, while your columns teem with compliments which could not arise if the public knew the advantages which would accrue to them from a further development of the two above-named institutions.'

Other letters contain complaints, and give examples of defective principles and construction, which are well known in professional circles, but probably have a touch of novelty to the writers and to the majority of the readers. Great stress is laid upon the fact of so many of these defects occurring in West-End houses; but as the whole system of house drainage is wrong, it is but natural that the wealthier portion of the community should take the first steps: hence the individual cases of alteration which are becoming so numerous are merely indications of the march of progress.

The obvious, but none the less useful, remedy is advocated—that intending leaseholders or purchasers should, before transacting business, insist upon receiving a certificate or report from a qualified surveyor; and if it were done it would go far towards a satisfactory solution of the subject. The testing of drains is also adverted to, and an architect writes:—'For some years hardly a week has passed in which I have not had to test drains by having them filled with water; and I only recollect one case of drains standing that test, unless where they had been very recently laid under the superintendence of a good sanitary surveyor, or by builders who had been recently trained in the system now used by our most able men. No drains should be accepted as perfect until they will stand this test, and I have generally found good builders glad to have the test applied so that their work could be guaranteed.'

Appreciation of true principles is shown by the allusion to the excellent sanitary arrangements of the latest phase of London house-building—viz., Flats, which, being carried out under the supervision of skilled architects, as a rule leave nothing to be desired. A leading example of this class of work at Brighton was lately noticed (*see* SANITARY RECORD for September 15, page 102), where the building-owner obtained considerable professional attention by the thorough manner in which the scheme was carried out. Evidences of this kind are not wanting to prove that correct views are making headway rapidly, and the majority of publications recently issued show that the science may safely be left in the hands of its present exponents. Further signs of progress are evinced by the measures being taken to counteract the pollution of rivers, the abatement of smoke, the agitation as to the disused burial grounds, the destruction and disposal of refuse, the Adulteration Acts, the proved fallacy of quarantine, and kindred subjects—a long and formidable list. We may flatter ourselves that we are in advance of other nations in these respects, but our requirements are much greater; and although the evils have been recognised for a long time past, it has necessarily taken a long time to clear the way to institute methods of procedure to counteract the influences of a long period of neglect. It is not to be supposed that a short lifetime can atone for the deficiencies of centuries.

A contrast to this perhaps congratulatory picture may be found in the doleful utterances of Dr. Norman Chevers, the President of the Health Section of the Social Science Congress. This gentleman's experience is very great, and it is therefore

discouraging to hear his views, although the disheartening effects are considerably lessened when it is found that his propositions for reform are of such a comprehensive nature as to practically deny the admission of the word 'progress.' Nothing short of absolute perfection in a comparatively short time is admitted; and here again we are met by the difficulty of defining a limit to the period in which such a desirable state is to be brought about. 'No power of concentrating language would enable us to detail, within a space of twenty minutes, even a bare list of grave sanitary shortcomings which every stranger must perceive within a week after he sets foot on British chalk.' Referring to the fallacy of placing dependence on death-rates, which, of course, depend greatly upon local circumstances, another grievous factor in the calculation is mentioned—viz., drink; and in this respect we fear the English nation cannot show a clean bill, or compare favourably with southern countries, although, with regard to those races of equal latitude with our own, it is doubtful if we differ much at *pro rata* with extent of population and the temptations and facilities thereby offered. The 'latrine on the lobby' is condemned, and the 'diphtheria-traps and plumbers' hunting-grounds' certainly do not compare favourably with the mediæval 'latrines,' the artistic construction of which received no scientific aid. But 'circumstances alter cases,' especially 'reduced circumstances,' as the cynic has stated; and the requirements of the inhabitants of a fortified castle are not those of the dwellers in cities and towns in which the insanitary evils are not only aggravated but induced by the reduced circumstances, or, in other words, the want of means for prevention or remediation. To place these necessary latrines in detached towers may be desirable, but the existing conditions will not allow of it; and to do so in all future works brings us again face to face with the item of expenditure, and to devote money and space to a portion of the building which is usually relegated to out-of-the-way corners is too sweeping a measure for general adoption. True it may be that forty years ago many of the great sanitary questions were nearly as advanced in men's minds as they are at this moment; but were they as advanced in material fact? Dr. Norman Chevers advocates the appointment of a Minister of Public Health, invested with great powers, against which all narrow self-interested opposition will be futile, and commanding large means (money again!). Then, and then only, will it be found that these great questions are to arrive at a practical solution; 'not as you are working now—struggling decade after decade for certain good ends, which you can only hope (probably in vain) to achieve by another and yet another of those already innumerable Acts of Parliament, despite which every crime against sanitation is still paramount throughout the realm.' Whatever may be our present rate of progress, it is hardly to be expected that an agreement to this can be found while human nature remains as it is. Vested right and interest are too deeply ingrained and sanctioned to be readily displaced, and we must deal with the world as we find it. 'Benevolent absolutism' is not for an over-populated civilisation.

Two women were fined 10s. each and costs at the Gateshead Police Court, for exposing for sale a number of rabbits in a putrid state, and which Dr. Robinson, medical officer of health, stated were totally unfit for human food.

THE REGISTRAR-GENERAL'S I QUARTERLY RETURN.

By J. HAMPDEN SHOVELLER.

THE Registrar-General has just issued his quarterly return of marriages, births, and deaths in England and Wales. The statistics relating to marriages for the second quarter of the year, while relating to births and deaths are for the three months ending September last. The marriage-rate: a marked increase upon the rate recorded in the second quarter of last year; the birth-rate was the average, while the death-rate, owing principally to the excessive fatality of summer diarrhoea, exceeded the average. The mean temperature for the quarter at the Royal Observatory, Greenwich, was 62°·7, and was considerably above the average for the corresponding periods of 112 years. The rainfall amounted to 4·53 inches, which was 3 inches below the average amount in the corresponding periods of 68 years.

During the second quarter of 1884 the marriages of 107,278 persons were registered in England and Wales, equal to an annual rate of 15·8 per 1,000 of the population, estimated by the Registrar-General to be rather more than twenty-seven millions of persons. This marriage-rate exactly corresponds with the average rate in the same quarter of the preceding years 1874-83, but exceeded by as much as 1·4 per 1,000 the rate recorded in the corresponding quarter of last year.

The births registered in England and Wales during the third quarter of this year were 2,254,454, corresponding to an annual rate of 33·0 per 1,000 of the estimated population. This birth-rate was 1·4 per 1,000 below the average in the corresponding quarter of the ten preceding years 1874-83. In several counties the birth-rates last quarter were: from 26·7 in Herefordshire, 27·2 in Westmoreland, and 27·8 in Sussex, to 37·4 in Monmouthshire, 40·5 in Nottinghamshire, and 40·5 in Durham. During the quarter under notice exceeded the average by 90,776; this represents the natural increase of the population. It appears from returns issued by the Board of Trade that 87,522 emigrants embarked during last quarter from the various ports of the United Kingdom at which emigration offices are stationed. Excluding foreigners, and distinguishing those whose nationality was undistinguished, the emigrants of British origin were 72,631, including 48,414 English, 6,339 Scotch, and 17,878 Irish. The proportion of emigrants last quarter to a million of the respective populations of the three divisions of the United Kingdom were 1,784 from England, 1,784 from Scotland, and 3,610 from Ireland. Compared with the corresponding quarter of 1883, the proportion of emigration last quarter showed a decline in all three divisions of the United Kingdom.

From returns published by the Local Government Board it appears that the average number of paupers relieved on the last day of each week in the quarter ending September last was 682,057, of whom 168,076 received indoor and 513,981 outdoor relief. The proportion of the population in receipt of pauper relief showed a further decline from the corresponding quarters of the preceding years.

The deaths of 134,678 persons were registered in England and Wales during the third quarter of 1884.

ual to an annual rate of 19.7 per 1,000 of the population. This rate was 1.1 per 1,000 the average rate in the corresponding periods in years 1874-83, and considerably exceeded as recorded in any of the three preceding quarters, which were 16.8, 17.8, and 16.8 respectively. This excess in the death-rate was mainly due, as above stated, to a fatal fatality of summer diarrhoea. In the counties the rate ranged from 13.5 in West-1, 14.4 in Oxfordshire, and 14.8 in Dorset-22.3 in Nottinghamshire, and 23.3 in Yorkshire and in Lancashire. In the principal districts, comprising the chief towns, and containing an estimated population of more than sixteen of persons, the rate of mortality last quarter was 8 per 1,000; in the remaining and chiefly population of about ten millions and three-quarters, the rate was 16.5. These urban and rural rates respectively 1.3 and 0.5 per 1,000 below the average rates in the ten preceding corresponding quarters. In equal numbers living, the deaths were 100 in the urban to 100 in the rural population. In the twenty-eight great English towns, including London, and having an estimated population of more than millions and three-quarters of persons, the rate registered corresponded to an annual rate of 1,000, which was 1.0 above the general urban rate while the death-rate in London did not exceed, it averaged 24.3 per 1,000 in the twenty-seven provincial towns, among which it ranged from Bristol, 17.1 in Brighton, and 18.0 in Derby, Bolton, 27.5 in Liverpool, 28.6 in Leicester, and 29.0 in Preston. The rates of mortality at different ages in the twenty-eight towns showed the

usual wide divergencies; the death-rate among infants, measured by the proportion of deaths under one year of age to 1,000 births registered, ranged from 161 in Bristol to 424 in Leicester. The rate of mortality among persons aged between one and sixty years did not exceed 8.2 in Brighton, whereas it was equal to 15.9 in Liverpool; and among persons aged upwards of sixty years the death-rate ranged from 44.4 in Brighton to 86.4 in Bolton.

The 134,678 deaths in England and Wales included 43,143 of infants under one year of age, 62,184 of children and adults aged between one and sixty years, and 29,351 of persons aged upwards of sixty years. Infant mortality was equal to 191 per 1,000 births, and considerably exceeded the average for the ten preceding corresponding quarters. In the twenty-eight towns the proportion of infant mortality averaged 242 per 1,000; it was 223 in London, but as high as 258 in the aggregate of the twenty-seven provincial towns, among which it ranged from 161 and 184 in Bristol and Huddersfield, to 335 in Norwich, 355 in Bristol, and 424 in Leicester. Among persons aged between one and sixty years the rate of mortality last quarter almost corresponded with the average, while among elderly persons it showed a slight excess.

The deaths registered in England and Wales during the quarter ending September last included 28,748 which were referred to the principal zymotic diseases; of these, 18,630 were attributed to diarrhoea, 2,256 to scarlet fever, 2,255 to whooping-cough, 2,120 to measles, 1,982 to 'fever' (including typhus, enteric fever, simple and ill-defined forms of continued fever), 1,049 to diphtheria, and 451 to small-

of the Vital and Mortal Statistics of the Twenty-eight Great Towns, dealt with in the Registrar-General's Weekly Returns, for the Third Quarter of 1884.

No.	Estimated Population in middle of 1884.	Births.	Deaths.	Annual Rate per 1,000 Living.		Deaths from Principal Zymotic Diseases.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping-cough.	Fever.	Diarrhoea.	Rate per cent. of Uncertified Deaths.	Deaths of Children under one year of age to 1,000 Births.
				Births.	Deaths.										
1.	3,752,354	74,086	49,711	33.9	22.8	12,859	232	1,053	899	340	1,060	686	8,569	2.8	242
2.	4,742,593	41,253	25,766	3.9	24.5	7,743	56	534	553	97	555	376	5,474	2.9	258
3.	4,019,361	32,833	23,965	32.8	20.9	5,116	196	419	345	243	505	310	3,097	1.2	223
4.	1,112,954	771	461	27.4	17.7	102	—	—	12	4	3	3	84	1.7	227
5.	133,052	1,137	554	34.3	19.7	137	—	8	3	9	2	15	100	0.6	2.1
6.	97,410	710	541	32.4	24.0	150	—	2	—	—	3	5	140	1.3	333
7.	75,569	610	382	32.4	20.3	65	—	10	1	1	5	10	34	1.0	185
8.	215,457	1,716	912	32.0	17.0	152	—	1	7	22	15	100	2.3	161	
9.	78,367	652	515	33.7	26.4	149	—	17	19	2	3	2	106	1.9	282
10.	421,256	3,552	2,451	33.9	23.4	794	—	94	30	4	90	18	552	1.1	259
11.	32,773	1,190	947	26.0	28.6	339	—	2	8	3	20	4	302	1.1	424
12.	205,298	1,983	1,319	38.8	31.8	497	—	8	4	10	29	24	312	0.8	302
13.	87,603	747	392	34.1	18.0	78	—	6	3	1	9	2	64	1.0	221
14.	90,870	858	445	37.9	19.7	79	—	1	3	1	3	4	61	5.2	197
15.	571,232	4,000	3,022	34.4	27.5	1,008	22	18	20	18	131	55	660	4.1	287
16.	138,663	939	739	31.5	27.2	228	—	47	6	—	8	12	153	1.0	227
17.	335,295	3,037	2,214	36.0	26.5	461	—	21	43	3	22	21	347	3.2	231
18.	247,151	1,666	1,208	31.9	24.6	380	—	10	42	5	25	26	272	3.2	281
19.	122,676	1,107	740	36.2	23.6	134	—	15	11	1	4	10	93	7.8	135
20.	110,408	1,061	737	38.5	26.8	220	—	49	8	—	16	147	3.0	2.0	
21.	97,481	955	732	38.5	30.3	261	—	25	14	2	3	13	205	3.5	355
22.	86,034	626	397	29.2	18.5	48	—	1	2	—	6	3	36	3.8	184
23.	76,479	569	478	29.9	25.1	91	—	37	7	—	11	6	30	5.4	246
24.	203,504	1,450	1,111	28.3	21.3	258	—	34	7	1	11	11	194	2.3	214
25.	347,324	2,745	2,119	33.4	26.0	624	—	37	80	12	39	24	422	2.4	286
26.	34,563	2,732	1,947	36.5	25.7	611	12	2	120	3	21	24	420	4.9	253
27.	181,225	1,720	1,091	38.1	24.2	335	7	24	9	1	11	22	264	3.8	271
28.	123,204	1,249	727	40.7	23.7	194	12	—	5	1	43	9	124	3.6	256
29.	151,325	1,569	926	41.6	24.6	168	—	2	26	2	13	13	112	2.3	203
30.	95,468	983	632	42.2	27.1	177	2	1	55	7	3	9	100	3.3	249

pox. These 28,748 deaths were equal to an annual rate of 4.20 per 1,000, against an average rate of 3.65 in the ten preceding corresponding quarters. The zymotic rate in the twenty-eight great towns last quarter averaged 5.89 per 1,000, and ranged from 2.24 in Huddersfield and 2.83 in Bristol, to 10.25 and 10.61 in Leicester and Preston. In fifty other towns this zymotic death-rate averaged 4.58 per 1,000, while in the remaining or rural part of the country it was 3.21.

Diarrhœa was by far the most fatal zymotic disease in England and Wales during the quarter under notice; it caused no less than 18,630 deaths, equal to an annual rate of 2.72 per 1,000, against an average rate of 1.91 in the corresponding quarters of the ten preceding years. In the twenty-eight towns the highest diarrhœa rates were 6.48 in Nottingham, 8.32 in Preston, and 5.14 in Leicester. Among the fifty towns the highest rates of mortality from diarrhœa were 6.96 in Ipswich and 8.42 in Northampton. In the remainder of England and Wales, after excluding the seventy-eight towns, the rate did not exceed 1.98 per 1,000. The 2,206 deaths attributed to scarlet fever were equal to an annual rate of 0.33 per 1,000, which was little more than half the average rate. In the twenty-eight towns the rate of mortality from this disease was 0.41, but was equal to 0.98 in Leeds, 1.60 in Sheffield, and 2.36 in Cardiff. Among the fifty other towns the highest scarlet fever death-rates were 1.93 in Walsall and 3.00 in Wigan. The rate of mortality from whooping-cough was 0.33 per 1,000, and slightly below the average. In the twenty-eight large towns the death-rate from whooping-cough last quarter was 0.49, and was equal to 0.93 in Liverpool and 1.40 in Sunderland. The 2,125 deaths referred to measles were equal to a rate of 0.31 per 1,000, which slightly exceeded the average; in the twenty-eight towns the measles death-rate averaged 0.48, but was equal to 1.78 in Blackburn and 1.94 in Halifax. Among the fifty other town districts the highest rates of mortality from measles were 2.80 in Warrington and 3.92 in Accrington. The 1,982 deaths ascribed to 'fever' corresponded to an annual rate of 0.29 per 1,000, against an average rate of 0.35 in the ten preceding corresponding quarters. The fever death-rate in the twenty-eight large towns averaged 0.31 per 1,000, the highest being 0.53 in Plymouth and in Salford, and 0.58 in Blackburn. In the fifty other towns the rate of mortality from fever averaged 0.35 per 1,000, and was equal to 1.21 in York, and 1.23 in Colchester. A very serious outbreak of typhoid fever occurred at Kidderminster during the quarter, resulting in 46 deaths. The mortality from diphtheria considerably exceeded the average. Among the large towns this disease showed the highest proportional fatality in London and Portsmouth. Of the 451 deaths from small-pox recorded in England and Wales during last quarter, 196 were registered in London, 153 more in the adjoining counties (nearly one-half of the latter being of London residents removed to the Metropolitan Asylum Hospitals outside Registration London), 22 in Liverpool, 12 in Sheffield, 12 in Sunderland, and 56 in other parts of the country.

The causes of 123,123, or 91.4 per cent. of the 134,674 deaths in England and Wales last quarter were certified by registered medical practitioners; and 6,981, or 5.2 per cent., by coroners in inquest cases. The causes of the remaining 4,574, or 3.4 per cent. of the deaths, were uncertified. In London

the proportion of uncertified deaths was only 1.8 per cent., whereas it averaged 3.8 in the rest of England and Wales. In the twenty-seven large ports the proportion of uncertified deaths was 2.9 per cent., and ranged from 0.6 and 0.8 in Southampton and Nottingham to 5.4 in Halifax and Oldham.

THE SANITARY RECORD

NOVEMBER 15, 1884.

The Editor will be glad to receive, with a publication, announcements of meetings, proceedings, and abstracts or originals of papers read before the members of any sanitary or health association.

Local Authorities throughout the country would confer a favour on the EDITOR of the SANITARY RECORD if they would forward all published documents relative to Water Supply, Sanitation, and Health matters generally to come under their notice. He would be glad to receive reports from Engineers or Surveyors, Sewerage Projects and Domestic Sanitation Improvements for notice, comment, or illustration.

WATER RATES.

DISPUTES between the London water company and their customers are now of frequent occurrence, and, judging from the reports which appear in newspapers, it seems as though much trouble is being expended. The time of the police-courts is being largely taken up in deciding questions as to the rateable value of premises supplied with water, though it may seem a hardship both to the water company and to the parties concerned that such questions should have to be decided there, though it is clear that magistrates are the proper tribunal to decide them.

Some ratepayers, however, who from their position might be expected to know better, are not so satisfied, and think that they have only to state that the complaint against a water company is not a nuisance, to obtain a judgment in their favour. One gentleman, for instance, who occupied stables as a dwelling-house, and presumably, therefore, as a person of some means, is reported to have obtained a summons against a water company, as they had ceased to give a constant supply of water to his stables and substituted an intermittent supply. He made the application himself, and evidently without any legal advice or assistance, for he had not ascertained whether there was any provision in the water company's Act obliging them to give a constant supply, and seemed astonished when he was told by the magistrate that the general Acts enforced such an obligation. The above case may be taken as a sample of many others which are of constant occurrence.

ere people fancy that they have a grievance water company and immediately rush into a summons, or into print in a letter to the without taking the trouble to ascertain their complaint is well founded. As regards ly by correspondence, we must leave that oked after by the editor of the journal to : letter may be sent ; but, as regards appli- o police-courts, the applicants should re- hat frivolous applications are a waste of e and a hindrance to the business which occupies the courts. It may not be always o insist that a ratepayer shall consult a fore commencing legal proceedings against ompany, though, as the law to be applied ed in a number of rather confused statutes, be generally advisable for him to do so ; ink an educated man may reasonably be to read for himself and try to understand es under which he wishes to take proceed- re he brings his case before a court. There ver, been many cases in which the result me being, at any rate, for notice of appeal ally been given) has shown that the con- s right in objecting to the claim. A case me recently before the magistrates at l has raised a question which, so far as we erved, is a new one in the controversy, whether the companies are entitled to the annual value, not of the dwelling- plied, but also of its appurtenances. In in question, they had included a stable and the assessment (as no dqubt they are in the poor-rate assessment), but the es thought it was absurd to include them oses of water rate, and struck them out. o refused leave to appeal. As far as we e from the short report we have seen, the was right ; but the question of what is to ed in the premises liable to water rate, is h, sooner or later, will have to be decided rt of Appeal.

ajority of cases which have been reported o special comment. The companies have, , in some instances been shown to have cessive and illegal charges for water in and it is asserted that they make such still. After the judgment in Dobbs's case that the assessment on which they were to charge was lower than that for which tended, they naturally enough attempted to for the diminution of income so caused g their rates and making the maximum to which they were legally entitled. For ose, as many of our readers will remember, ed papers of interrogatories to be answered holders, so as to give themselves the mate- which to reassess the properties within icts. Some of these interrogatories were , but the bulk of them were probably d to the waste-paper basket. The com- complain that this has rendered their task of ment unnecessarily difficult. However, h information as they could obtain, they ised their assessments, and while charging rateable and not on the gross value of ises supplied, have in many cases raised ble value so considerably above what it uly as actually to increase the rate

When they have so revised them, they notices to the ratepayers telling them of

the alterations and demanding payment according to the increased rate. In spite of certain letters which have appeared in the *Times*, we have no doubt that such notices were sent out in due course, though, like other circulars, they were very likely never read by the persons to whom they were addressed. As the notices were in many cases not attended to, and the increased assessment of the premises was not challenged, the companies have as a matter of business attempted to get their rates paid, and have in some cases cut off the water-supply when the money was not forthcoming. This conduct is complained of by those whose supply is cut off as harsh and unfeeling ; but the companies are empowered by section 74 of the Waterworks Clauses Act, 1847, to cut off the supply if water rates are not paid at the regular times of payment thereof, and unless they have exceeded their powers, it is useless to complain of their conduct. They are corporations, and as such are proverbially not influenced by human feelings. Whether the power of cutting off water is one which they should possess is another question, and it may well be that this power should not be given to the companies themselves, but should only be exercised by a court of summary jurisdiction. Such an alteration in the law has been proposed, and in the interest of the health of the community it might well be made. In the meantime it is well to remember that the companies have the right to cut off the supply if their rates are not paid, and that the fact of there being a dispute as to the valuation of the premises is not a sufficient ground to prevent their exercising their right. As was recently said by the vacation judge, on an application for injunction to make the East London Company restore the supply where it had been cut off, 'an interference with their statutory rights might cause mischief and wrong to them which it would be difficult to measure, while the inconvenience to the ratepayer was merely that he would have to pay a few shillings additional rates, with the certainty of the money being subsequently returned by order of the court if he was right in his contention.' Wherever, therefore, a householder is dissatisfied with the valuation put upon his premises by his water company, his proper course is to pay the amount claimed *under protest*, and, if he thinks his case good enough, to apply to a court of summary jurisdiction (*i.e.* to the nearest police-court) to have the value of his premises determined. The valuation for the poor-rate is a guide as to the figure at which his premises should be assessed, but it is not necessarily the value at which the magistrate will arrive. If the value put by the water company is much in excess of the poor-rate valuation it may be worth while to appeal to a court ; but if it is only slightly so, it will probably be better to put up with a rate slightly in excess of what the householder believes to be the right one, for even if he succeeds in reducing the charge it does not follow that he will get the costs of so doing, and the expense and trouble incurred may be greatly in excess of the reduction which he obtains.

FEEDING-BOTTLES.--Dr. Blackett, medical officer of health to the Brandon Local Board, ascribes much of the infantile sickness and mortality in the county of Durham to the common use of the feeding-bottle, when used for condensed milk. For want of sufficient cleaning the moupieces of the bottle are often half choked with clots of acidulated milk, while the tubes are lined with fungoid growths, teeming with minute insect life.

THE COCK-CROWING NUISANCE.

THE Nuisances Removal Act of 1855 (which is still in force as regards the metropolis, though elsewhere it has been superseded by the Public Health Act, 1875) contains a section, 13, which empowers justices by their order (a) to require the owner or occupier of premises which are in an insanitary state to provide sufficient privy accommodation, means of drainage or ventilation, or to make safe and habitable, or to cleanse, pave, whitewash, disinfect, or purify them or such part thereof as the justices may order; or (b) to require him to drain, empty, cleanse, fill up, amend or remove an injurious pool, ditch, gutter, watercourse, privy, urinal, cesspool, drain, or ashpit, which is a nuisance or injurious to health, or to provide a substitute for that complained of; or (c) to carry away any accumulation or deposit which is a nuisance or injurious to health; or (d) *to provide for the cleanly and wholesome keeping of an animal kept so as to be a nuisance or injurious to health, or, if that is impossible, then to remove the animal.* The Public Health Act, in sects. 91 *et seq.*, contains similar powers. It is obvious to any one who looks at the Acts and considers their scope, that these powers were intended to provide a summary means of getting rid of nuisances which might be prejudicial to public health; but that they do not deal with acts or omissions which, though coming within the legal definition of a nuisance and liable to be dealt with at common law, are not nuisances injurious to health. This is not only the meaning which one would naturally place on these sections, but it is that which has been decided to be the law. For instance, it has been held that justices have no power summarily to prohibit the continuance of a nuisance caused by continual dripping from a railway bridge on to a road, though that is, no doubt, a nuisance which might be remedied by the more expensive and more dilatory process of an indictment.

The portion of the above section relating to animals obviously was intended to apply to such places as pig-styes or overcrowded and insanitary cow-houses or stables, and it has been held that it does empower justices to deal summarily with them. Recently several attempts have been made before Metropolitan police magistrates to extend its operation to cases of nuisance caused by the keeping of *noisy* animals, generally crowing cocks, and the newspaper reports show that different magistrates take different views of their powers. Mr. Paget (*see* SANITARY RECORD for May 15, 1884, p. 554) and Mr. Barstow seem disposed to think that they can order the animals to be removed or destroyed in cases where satisfactory medical evidence is forthcoming to show that the health of any person has been injuriously affected by the noise: and there may, no doubt, be such cases, especially where the person affected is nervous or an invalid. Mr. Partridge is reported to have doubted his power to deal with such a nuisance, though he eventually granted a summons; and Mr. D'Eyncourt in another case refused a summons, telling the applicant she might bring an action for damages in the county court.

Neighbours who are annoyed by noise are perfectly justified in adopting the most ready legal means of stopping the annoyance which they can find available; and, where they find a magistrate disposed to entertain their complaint, may be able to get the nuisance abated summarily. If, however, the owner of the noisy bird or dog should object to

the jurisdiction of the magistrate to interfere, and should think it worth while seriously to fight the question, to the extent of an appeal if necessary, we have no doubt that it would be held that the nuisance caused by keeping a noisy animal—though it may in extreme cases be really detrimental to health—is not a nuisance which can be dealt with summarily under the Nuisances Removal Act or the Public Health Act. The persons who suffer annoyance, if the annoyance is substantial, have their remedy by action; and, if they wish to avoid expense, can bring the action in a county court. If a case is made out for it, either the county court or the High Court can grant an injunction to prevent a repetition or continuance of the nuisance, and would no doubt do so. The majority of the complaints which have been made to magistrates have probably been trivial, and if such complaints are kept out of court altogether so much the better for everyone; if the complaint is substantial, a police court is not the proper tribunal to settle it.

NOTES OF THE MONTH.

PREVENTION IS BETTER THAN CURE.

MISS BARNETT, of the National Health Society, 44, Berners Street, W., has started on another lecturing tour in the provinces. Manchester, Carlisle, Keswick, Workington, Cockermouth, and many other towns are to be visited. Her subjects are likely to prove attractive at a time when sanitary precautions are more needed than usual. 'How to Oppose the Cholera,' 'Prevention of the Spread of Infectious Diseases,' 'Air and Ventilation,' 'Good Food,' 'Sensible Dress,' 'Management of Infants,' and kindred subjects, are all treated in a simple practical manner. It would be a great advantage to the working population if such teaching could be constantly and thoroughly carried out in every town and village of the United Kingdom, so that the motto of the society—*Prevention is better than Cure*—should become a principle constantly carried out in practice.

THE VENTILATION OF SEWERS.

A REPORT was lately presented to the City Commissioners of Sewers by the Streets Committee relative to the suggestion of Mr. J. S. Scott:—'That in all instances where new houses are being erected the Commissioners of Sewers place themselves in communication with the building or other owner, and treat with him or them for the construction of a proper ventilating shaft in the chimney-breasts of party or other walls for the purpose of ventilating the sewers, carrying the ventilating shafts well above all adjoining roofs.' It was also stated that many years must elapse before this proposal could be carried out to an extent sufficient to have any practical effect, although the engineer explained that at the present time the Commissioners were always willing to place ventilators against the fronts or sides of houses wherever the owners allowed them to do so. The committee recommended that the suggestion be adopted, and it was determined to do so. Upon a former occasion (SANITARY RECORD, Aug. 15, p. 64) we commented upon the suggestion, and mentioned certain facts to be borne in mind; but as the provinces have carried out the same

ideas to a great extent, we may refer to an exhaustive report by Mr. E. Buckham, the borough surveyor of Ipswich, who in the earlier part of the year obtained valuable particulars of the working of the system in various large towns to the number of thirty-two, including seaside towns and manufacturing centres. According to his report, compiled from the surveyor's and engineer's information, the plan generally adopted is by an open man-hole and lamp-hole covers level with the street surface, supplemented in many towns with vertical iron pipes carried up in suitable positions on buildings and by factory chimney-shafts. The distance between surface-ventilators is given in some cases as low as forty yards and in others two hundred yards apart. In the case of the city of Coventry 1,500 vertical shafts of piping have been applied. They are also being extensively used at Great Yarmouth, and applied to the ends of small sewers in back roads or passages. These upright pipe-ventilators in many cases are reported not to have reduced the smell from the surface manhole-grates nearest thereto to the extent desired. Although in many cases the effect has not been what was expected, in other towns the result is spoken of as most satisfactory; in many towns referred to the plan has not been tried, for the reason that the ventilation from the surface-gratings is considered satisfactory. At Eastbourne the report is that vertical pipes have been tried, but with no effect in reducing smells from surface-ventilators; on the other hand, the surveyor of Bournemouth says that since the system of upright pipe-ventilation has been completed the complaints of smells coming from road grates have nearly ceased. At Gloucester, Yarmouth, Leeds, &c., also, there have been—considering the small number fixed—good results, but at Hove the returns are unsatisfactory. Improved exhaust-cowls for creating an upward current in the vertical pipes have only been applied in a few instances, the general opinion being that better results are obtained without them. In reply to inquiry whether in cases of complaint of nuisance arising from surface-ventilation upright pipes had been fixed near thereto with a view to its abatement and the closing of the street ventilator, it is found that in very few cases have openings been closed on such complaints; the rule has been to make more openings either at the street level or by vertical pipes. Hove and other towns report that the ventilators are never closed under any pretext whatever. In some cases the upright pipes have reversed the action of the openings in the street by causing a down-current in the one nearest thereto. At Bournemouth this was so, but from Carlisle 'some have acted in this way'; but generally the current is up. At Croydon a down-current was clearly shown, as ascertained before and after by anemometers. The surveyor of Gloucester states that the fixing of vertical shafts near to the sewer openings will not create a down-current, unless the 'sum of their sectional areas exceeds that of the two street vents between which they are placed, or the maximum sectional area of the air-space in the sewer itself, whichever happens to be greater.' At Yarmouth the vertical shafts affected the street openings to a distance of thirty yards; the same result has been noticed at Hereford, particularly in those cases where exhaust cowls have been fixed. Public sewers have been connected to tall chimney shafts in some places, and at Bolton the results are reported as good. At

Leicester twenty-five shafts have been applied, and the Corporation are extending the system; but from Sunderland they are not a success. Mr. Buckham, who has thus had great opportunities of forming a reliable opinion, has recently stated: 'I think, on the whole, ventilation by open gratings, level with the street surface only, to be a mistake; they should be accompanied with a system of upright shafts; the total areas of such shafts should exceed the areas of the street gratings; the result would be that there would then be a down-draught in the street openings and an up-current in the shafts. I am now acting upon this principle in Ipswich with the most satisfactory results.' It is highly desirable that the City Commissioners of Sewers should carefully consider the probabilities before they define any hard and fast rule, and the experience already gained cannot fail to be of the utmost assistance.

THE ALLEGED INCREASE OF DRUNKENNESS IN BIRMINGHAM.

It may be remembered that during the recent inquiry into the sanitary condition of Birmingham and the dwellings of the poor, much stress was laid by some persons upon the prevalence of drunkenness in that town, and the temperance party sought to show by statistics and evidence of facts of everyday occurrence that much of the poverty and wretchedness existing in some parts of the town was due to the great temptations placed in the way by the large number of licensed houses. A deputation of the temperance party waited upon the authorities to urge the consideration of remedial measures, and the allegations then made were replied to in detail by the Licensed Victuallers' and Retail Brewers' Associations. The result was the appointment of a special committee by the borough justices to consider the whole subject. This committee have presented their report, and at a meeting of the justices a few days since it was unanimously adopted. The committee state that, after considering the returns of the chief constable, they found that there had been a considerable increase in the number of charges of drunkenness during the past two years as compared with the numbers in previous years; but that this increase, in a large degree, is attributable to the greater vigilance on the part of the police. There was not evidence sufficient to justify the statement that drunkenness was on the increase in the borough. After hearing the views of the chief constable as to the alleged undue proportion in the number of cases of drunkenness and the number of convictions for permitting drunkenness, or for selling drink to persons whilst drunk, the committee personally examined several of the divisional superintendents of police, and returns of the charges were produced, showing the result of the prosecutions. There was no doubt that the absence of convictions in many cases was due to the fact that the offenders were charged with permitting drunkenness to take place on licensed premises, in which case the law required knowledge on the part of the landlord to be proved. The committee therefore recommend that in future instructions should be given to the chief constable to prefer an information (where the evidence warrants it) for selling drink to persons whilst drunk, in which cases it is not necessary to show that the landlord knew of the drunken state of his customer when he supplied him with drink. The superintendents believe there is an increase in the number of cases of selling drink

in brothels and unlicensed premises, and they attribute this to the inadequate fines recently imposed on conviction. But the evidence showed that these houses are as well, if not better, conducted than those kept by the proprietors or tenants of the licensed premises; therefore they see no ground for recommending any interference in this respect, but were of opinion that the system at present in force is perfectly satisfactory.

SEWER VENTILATORS.

AT the last monthly meeting of the Lanchester Local Board, Mr. Joseph Walton, a butcher, made a complaint of the nuisance arising from the terrible stench from a sewer ventilator which had recently been placed near his shop, to the great deterioration of his meat and injury to his trade. Other residents in the same neighbourhood had complained bitterly of the nuisance to the inspector, but had not received any reply. After an animated discussion a committee was appointed to inquire into the matter with a view to a remedy.

PAYMENT FOR HOSPITAL ISOLATION.

A CASE was tried in the Salford County Court a week or two ago which illustrates in a very forcible fashion how a narrow conception of municipal duties and responsibilities hinders effective action for the control of infectious disease. The Swinton and Pendlebury Local Board had sent a child into the local children's hospital, whilst suffering from typhoid fever; at least they persuaded the mother to let the girl go. The Local Board was charged six guineas by the hospital authorities for maintenance of the child, and this sum they tried to recover from the mother. The woman stated in Court that her husband's wages had only averaged twelve shillings per week for the previous fortnight, as he was on short time. The action was commenced under section 132 of the Public Health Act 1875, which enacts that any expenses incurred by a local authority in maintaining in a hospital, &c., a patient who is not a pauper shall be deemed to be a debt due from such patient to the local authority, and may be recovered from him at any time within six months after his discharge from such hospital, &c., or from his estate in the event of his dying in such hospital. The patient being a child under age, the Local Board brought its action against the father, but Mr. Russell, Q.C., held that the action should have been brought against the patient according to the section, but in this case, the patient being under age, the board was without a remedy.

This version of the law is a somewhat novel one, and if, as is stated, the Local Board appeal against it, would probably be upset by a superior court. But outside altogether of the technical legal point, the case appears to us to present points of general interest, as touching a matter of general policy. Was the Local Board wise in dragging this poor woman into the County Court in order to recover from her expenses which they had persuaded her to incur, and which represented some two months' wages of her husband? It would no doubt be a dangerous experiment to ostentatiously throw open the infectious wards of a hospital to all and sundry, free of charge in every case; but the repayment of expenses of maintenance in such a hospital ought to be looked upon as the exception rather than the rule, and we are convinced that that authority acts

most wisely in the general interest of its constituents which makes the isolation of infectious cases in hospital as easy and as little burdensome as possible to the individual. The primary concern of the authority should be to stamp out disease; the payment of the burden of the expenses incurred should be a secondary matter.

'SWEEP! SWEEP!'

THE faith of the public, in the ability of metropolitan police magistrates to remedy any inconvenience which they may be subject, seems boundless. They only do they apply to them to get rid of the nuisance caused by their neighbours keeping noisy parties for which there may be some apparent justification in the somewhat obscure words of a section of the Act of Parliament, but a gentleman is reported to have recently applied to Mr. Cooke at Marylebone to abate a noise over which, as far as we are concerned, the magistrate had no jurisdiction whatever. The complaint was that a man employed by a chess club would persist in making the early morning sweep hideous and disturbing the rest of the neighbourhood by loud cries of 'Sweep!' This conduct is no doubt annoying, as the utterance of most cries is, but we have not been able to discover if it was an offence cognisable in a police-court. A persistent making of any noise in an inhabited neighbourhood may amount to an actionable or an actionable nuisance. There is an old case of the King v. [unclear] which is reported in Strange's Reports as follows: 'The defendant was convicted on an indictment making great noises in the night with a square trumpet, to the disturbance of the neighbourhood, which the Court held to be a nuisance, and the defendant 5*l*.' There are also many cases in which persons aggrieved have successfully brought actions in cases where they were seriously annoyed by noise. Magistrates have, however, no jurisdiction over such matters except such as is given by statute. In the metropolis they have power to impose small fines for such matters as musicians refusing to desist when desired by a householder to do so, or as 'wantonly disturbing any inhabitant by ringing a door-bell without excuse,' or, again, 'blowing any horn or using any noisy musical instrument for the purpose of disturbing people together or of announcing any show or entertainment' (which latter power might perhaps successfully be invoked against the Salvation Army). These powers, however, obviously do not meet the cry of the sweep; and, as far as we are concerned, persons disturbed by him must either indict and bring an action against him, or else make up their minds to put up with the disturbance. Some persons under their private Acts possess power to make by-laws, and we believe have made by-laws for the purpose of prohibiting or regulating street sweeping. Where this has been done there is, of course, the power of summarily imposing a small penalty in case such by-laws are infringed. But elsewhere the only remedy available is that which, as we have pointed out, is afforded by the common law. If persons seriously think that further powers of interference are needed, they must ask Parliament to give them. Such powers would, however, if wanted for the purpose of dealing with trivial annoyances, which are beneath the notice of any superior or inferior Court, and which we think may well alone.

POISONING BY SHRIMPS.

alarm has been recently created by a paragraph which has gone the round of the papers, in account of the poisoning of sixty-nine persons from eating shrimps, on September 21.

The paragraph is based upon a report to the Thanet Sanitary Authority by their medical officer of health. According to this the sufferers lived in houses in Northdown, Margate, and nearly all taken ill from six to twenty-four hours after eating of the shrimps, the symptoms being vomiting and cramp, and exhaustion. In the case of two women the attack seems to have been on labour, and one of these died, her death certified as puerperal fever. So many being almost simultaneously a common cause was sought for and none could be discovered save the shrimps.

At every house (with two exceptions) shrimps were delivered, those who ate were taken ill. In one of the two houses forming an exception the purchaser threw the shrimps away, and in the other the shrimps were bought raw, washed and boiled by the consumers. None of the shrimps which proved so unwholesome could be used for examination, nor the water in which they were boiled, and as the pan used was an iron one there was no evidence of metallic poisoning. The reporter points out that the shrimps were caught 'near the outfall of the Margate sewer,' and that the 'shrimps, there could be no doubt, were out of season, and they were, therefore, not fit for consumption.'

The family who escaped are stated to have been in the out-of-season-state of the shrimps, and they had to cleanse them of what appeared to be a parasitic attachment.

The Town Council of Margate having had their attention drawn to the matter, instructed their medical officer of health to make full inquiry and report. This report, dated Oct. 14, is now before the Council. Shrimps in question it appears were caught on ground between Nayland Rock and the Jetty, 'the man who took them stating that 'he caught shrimps in the same place for the last three years, and that he has never known them to be poisonous or to produce injurious results. He is at the distance of a mile from the outfall of the town sewer.'

Another man was shrimping alongside him on the same ground. Independent testimony was that no stale or other shrimps were mixed with the shrimps caught on Saturday night. A relative of the man who caught and sold the shrimps stated she boiled some for her own use 'in the ordinary way and without any cleansing.' Her husband and children, as well as herself, partook of them, and sustained no ill effect. In two adjoining houses, with the same water-supply, the man who had eaten part of the shrimps boiled by the man who caught them suffered severely. The man caught on the same ground on the same night were boiled in the ordinary way and not a single individual suffered in consequence of eating them. The conclusions the medical officer of Margate arrives at as the result of his inquiry are as follows:—

1. The shrimps boiled by Atwell on Sept. 20, and eaten by him on the following morning, caused sickness in Northdown; that the shrimps when they were wholesome, and that they were not condemned by sewerage matter or infected with parasites, so that it appears probable that the shrimps

became injurious during the process of boiling, some deleterious matter being either present in the pot or having been accidentally introduced therein.'

Mr. Henry Lee, late of the Brighton Aquarium, a well-known authority, writing to the *Times*, states that the assertion that shrimps are out of season in September is entirely contrary to fact. 'If they are out of season in any period of the year it is in May, as they cast their shells in April, and their newly-formed flesh is then flabby for a time.'

DISTRESS IN THE NORTH AND THE DEATH-RATE.

It is somewhat remarkable that the increase of the distress from want of employment in the north has been accompanied by a reduction in the annual death-rate. In Newcastle for the week ending Nov. 1, the average rate only reached 19 in the 1,000. During the same week Sunderland only showed an average of 20 in the 1,000, whilst the average death-rate of Hebburn for the month of October was only 14.3 per 1,000 per annum.

SANITARY ASSURANCE SOCIETIES' REPORTS.

A LAW case, which will probably be read with interest by the administrators of the numerous sanitary assurance societies that are now springing up in all parts of the country, was tried on October 22 at Glasgow, before Sheriff Substitute Rutherford. The circumstances which gave rise to the action were as follows:—The tenant of Huntington House, Haddington, applied to have the drainage and water-supply system of the house inspected and reported upon by one of the engineers of the Edinburgh Sanitary Protection Association, which was accordingly done on June 10 last. The report having by some means reached the hands of the proprietor, Mr. Robert Ainstie, he demanded an apology and that the association should withdraw the report. On the association, through their secretary, declining to do this, he brought an action in the Sheriff Court against Mr. James Thomson, C.E., the writer of the report, the Sanitary Protection Association, and their secretary and treasurer, demanding 500*l.* damages. Mr. Ainstie's pleas were:—1. That the statements in the report were false, reckless, and malicious, or without probable cause; and that the defenders were liable jointly and severally to the pursuer. 2. The sum sued for in name of reparation and solatium being fair and reasonable, decree should be pronounced as craved. The defenders, in reply, pleaded that the report was a privileged document, that it was substantially true, and that it was devoid of malice. This view was also taken by the sheriff, who in a somewhat sententious judgment, decided in favour of the association. The exact terms of the report on which the claims for damages were based are not definitely stated, but the report appears from the sheriff's 'opinion' to have been 'very complimentary to the sanitary arrangements in the interior of the house.' It is safe to say that in this respect it differs organically from most of the reports of sanitary engineers upon the drainage system of private houses.

THE BATTERSEA DUST YARDS.

IT is a curious reflection on our present impotent system of local government, and the apparently unlimited powers of the metropolitan water companies, that the objectionable and dangerous dust yards situated within a few yards of the reservoirs and filter beds of the Southwark and Vauxhall Company at Battersea should continue in active operation. Twelve years ago the late Mr. Netten Radcliffe described the nuisance as peculiarly injurious to the purity of the water, and evidence strongly emphasising this view is afforded by the health officers of the Wandsworth Board of Works, in whose jurisdiction the yards are situated. In a recent report these officers point out that the water-supply of the district, both as regards quality and quantity, is still unsatisfactory, and that that supplied by the Southwark Company contained relatively the largest amount of impurity, and was in the worst condition as regards turbidity and the presence of living organisms. This state of things has practically existed for the past twelve years, notwithstanding the reiterated protests of the local sanitary authority, the constant appeals to Sir Charles Dilke, and the promises of amendment on the part of those responsible for the nuisance. It is not so well known as it might well be that the company, by sect. 16 of their Act of last session, obtained powers to purchase this particular plot of land, and there exists nothing whatever to hinder them from doing so. The plea of poverty is ridiculous; but, even admitting that the exchequer of a company whose shares are selling at nearly 100 per cent. premium can be considered impoverished, there can be no excuse for the failure of the directors to adopt the simple and inexpensive plan of covering in the filter beds and reservoirs. It is to be hoped that the Local Government Board, who possess some sort of supervision over the doings of these companies, will take immediate steps for compelling the removal of an obvious danger to the health of many thousands of people.

NON-PAUPER PATIENTS IN INFECTIOUS HOSPITALS.

AN important step has been taken by the Metropolitan Asylums Board towards the unification of the arrangements for repressing infectious diseases which has for so long been a desideratum in the metropolis. At the meeting of the managers, held on October 25, an exhaustive report was presented by the General Purposes Committee on the question of the reception and treatment of non-pauper patients at the managers' hospitals. The report stated that the distinction having been practically abolished by the Legislature, and further hospital accommodation having been provided by the managers in accordance with the recommendations of the Royal Commission, the committee—upon the assumption that the managers, in maintaining the provision they have now made, and in making such further provision as they may hereafter find to be necessary, are not hampered or harassed by legal proceedings—were unanimously of opinion that the time had now arrived when patients suffering from dangerous infectious disorders should be admitted to the managers' hospitals upon the orders of the medical officers of health, as well as upon those of the district medical officers and relieving officers; and they accordingly recommended that the Local

Government Board be requested to place themselves in communication with the several local authorities of the metropolis with the view to issuing an order which shall empower the managers (in accordance with the terms of Clause 15 of the Poor Law Act of 1879) to contract with such authorities for the reception into the managers' hospitals of cases of dangerous infectious disorders other than those chargeable to the various parishes and unions. This report was unanimously adopted by the Board, and the matter is now receiving the attention of the authorities at Whitehall.

THE POLLUTION OF THE RIVER LEA.

THE condition of the lower reaches of the River Lea, to which we drew attention in our issue of September, appears to have at length aroused the serious attention of the dwellers upon its banks. The residents at Clapton have appointed a committee to investigate the matter, and this committee reported recently to a public meeting, held at Hackney, that, though unable to point to an immediate and distinct cessation of the pollution, they had reason to believe that a satisfactory result was but a matter of the comparatively near future, and the steps taken by the committee had at least been successful in securing the highest official attention to the matter. They had persistently urged the Hackney local authorities not to relax their pressure upon the Lea Conservancy to insist upon the rigorous application of the present notice, and to support that Board in a threatened application for an injunction against the Tottenham authorities. In the meantime, the committee recommended—1, that they should continue their efforts for the protection of the river; 2, that riverside committees should be formed to watch and report from week to week the condition of the river and for obtaining categorical evidence of continued pollution; 3, that petitions to Parliament should be prepared praying that increased powers should be given to the Lea Conservancy Board to more speedily and effectually protect the river from pollution. A resolution was also carried that, looking to the fact that Tottenham, Walthamstow, Leyton, and West Ham all discharge their sewage into the Lea, and seeing that those districts were greatly increasing in population, nothing was feasible short of an intercepting sewer to carry the sewage of those districts after treatment to the Thames at Barking, and that the Home Secretary be memorialised on the subject. Some means must evidently be taken to relieve the present deadlock; and it will be better that the riparian authorities of the Lea should move in the matter of their own free will rather than upon compulsion, which is only a matter of time under present circumstances.

LEAD POISONING.—In consequence of two young women having become blind by working at a lead factory on the Tyne, and thereby become a permanent burden on the ratepayers of Gateshead, the Board of Guardians have again memorialised the Local Government Board to urge on manufacturers the desirability of introducing mechanical appliances in the most dangerous processes of manufacture, particularly that of carrying white lead to and from the stoves. The manufacturers say that they have done all that the Government regulations require them to do, and the cases referred to are simply the result of their work-people culpably neglecting to avail themselves of the safeguards provided for them.

THE PUBLIC HEALTH

DURING OCTOBER 1884.

n temperature during the month of October at Observatory, Greenwich, was 48°·9; it was 0°·7 average October temperature in one hundred was 1°·5 below that recorded in the corresponding of 1883. An excess of temperature prevailed days of the month, while on the other twenty it was below the average. The warmest day month was the 16th, when the mean was 56°·2, and an excess of 5°·0; the coldest day was when the mean was only 49°·5, and as much below the average. Rain was measured

on twelve days during the month, to gate amount of exactly 1 inch, which was but than a third of the average October rainfall in years. During the first ten months of this year ll amounted to 14·5 inches, which was as much below the average rainfall in the same period ie years. The sun was above the horizon during rs during October, but only 59·3 hours of bright were recorded at Greenwich; this amount was at registered in the corresponding period of since 1880. The wind was very variable almost it the month.

twenty-eight large English towns dealt with by strar-General in his weekly return, which have ed population of more than eight millions and ters, 29,307 births and 17,223 deaths were during the five weeks ending the 1st inst. The , which had been 33·3 and 34·4 in the two months, further rose to 34·9 during October, ed that recorded in the corresponding period of the two preceding years, 1882-83. In these ght towns the lowest birth-rates last month were radford, 28·8 in Brighton, and 30·7 in Halifax; er towns the rates ranged upwards to 39·9 in 40·6 in Sunderland, and 47·0 in Cardiff. The last month in London was 34·1 per 1,000, while d 35·6 in the twenty-seven provincial towns.

nnual death-rate in the twenty-eight towns, the two preceding months had been 24·2 and 1,000, further declined to 20·5 during October, the decreased fatality of diarrhoeal diseases, , however, exceeded by 0·8 per 1,000 that re- the corresponding period of 1883. The lowest mortality last month in these towns was 15·9 in th. The rates in the other towns, ranged in n the lowest, were as follow:—Birkenhead, 17·9; , 18·1; London, 18·6; Norwich, 18·7; Halifax, radford, 19·8; Derby, 20·1; Bristol, 20·2; am, 20·5; Nottingham, 20·5; Plymouth, 20·5; ield, 20·9; Salford, 21·2; Hull, 21·4; Shef- 6; Leicester, 21·8; Oldham, 22·5; Wolver- , 23·0; Cardiff, 23·3; Leeds, 23·7; Sunder- 3; Manchester, 24·6; Newcastle-upon-Tyne, verpool, 24·9; Bolton, 25·0; Blackburn, 25·2; highest rate during the month, 29·2 in Pres- hile the death-rate in London, as above stated, xceed 18·6 during last month, it averaged 22·2 o in the twenty-seven provincial towns. The leaths from all causes in the twenty-eight towns be five weeks of October included 2,244 which rred to the principal zymotic diseases, of which led from diarrhoeal diseases, 345 from 'fever' lly enteric), 320 from scarlet fever, 253 from g-cough, 226 from measles, 164 from diphtheria, rom small-pox. These 2,244 deaths were equal cent. of the total deaths, and to an annual rate er 1,000. This zymotic death-rate showed a con- decline from that in the preceding month, owing cline in the mortality from summer diarrhoea, and hly below that recorded in the correspond- od of 1883. The zymotic rate in London

during October did not exceed 1·94 per 1,000, whereas it averaged 3·29 in the twenty-seven provincial towns, in many of which comparatively high death-rates from diarrhoea were recorded. The zymotic rates in the provincial towns ranged from 1·0 in Portsmouth, 1·2 in Brighton and in Plymouth, and 1·4 in Norwich, to 4·8 in Hull, 5·0 in Cardiff, 5·1 in Bolton, and 7·1 (of which 3·5 was due to diarrhoea) in Preston.

Diarrhoea was the most fatal zymotic disease in the twenty-eight towns during October. The rate of mortality from this disease, which had been 4·97 and 3·19 in the two previous months, further declined to 1·02 during October, but considerably exceeded the rates in the corresponding period of either of the two preceding years, 1882-83. The highest diarrhoea death-rates last month were recorded in Sheffield, Blackburn, Hull, and Preston. The rate of mortality from 'fever' (principally enteric or typhoid), which had steadily increased in the five preceding months from 0·22 to 0·38 per 1,000, further rose during October to 0·41, a higher rate than has been recorded in any month since November 1883. In London the fever death-rate did not exceed 0·28 per 1,000, while it averaged 0·53 in the twenty-seven provincial towns, among which the highest rates were 1·05 in Leeds, 1·11 in Salford, and 2·98 in Derby. The rate of mortality from scarlet fever was 0·38 per 1,000, and showed a slight decline from the rate in the previous month; this disease showed the highest proportional fatality in Preston, Sheffield, and Cardiff. The death-rate from whooping-cough, which had declined in the six preceding months from 1·10 to 0·36 per 1,000, further fell last month to 0·30, which, however, slightly exceeded the rate recorded in the corresponding period of last year. In London the rate of mortality from whooping-cough was only 0·16 per 1,000, while it averaged 0·42 in the provincial towns, among which the highest rates were returned in Nottingham and Sunderland. The death-rate from measles was 0·27 per 1,000, and corresponded with that recorded in the preceding month; in London the rate from this disease did not exceed 0·18 per 1,000, while it was equal to 1·23 in Cardiff, 1·36 in Preston, and 2·11 in Bolton. The rate of mortality from diphtheria showed a further increase upon that recorded in the two previous months; this disease was proportionally almost twice as fatal in London as in the aggregate of the provincial towns. During the five weeks of October 77 deaths from small-pox were registered in the twenty-eight towns, showing a considerable increase upon the number during September; of these, 64 were returned in London, 4 in Birkenhead, 3 in Sunderland, 2 in Liverpool, 2 in Hull, 1 in Wolverhampton, and 1 in Birmingham. Judged by the returns of the Metropolitan Asylum Hospitals, the prevalence of small-pox in London showed an increase during October. The number of small-pox patients under treatment in these hospitals, which had declined from 1,290 to 536 at the end of the four preceding months, rose to 580 at the end of October. The average weekly number of new patients admitted to these hospitals, which had been 73 and 84 in the two previous months, rose during October to 148.

The rate of infant mortality in the twenty-eight towns, measured by the proportion of deaths under one year of age to births registered, was equal to 160 per 1,000 during October, against 162 and 156 in the corresponding periods of the two preceding years, 1882 and 1883. While the rate of infant mortality did not exceed 130 in London, it averaged 183 in the twenty-seven provincial towns, among which it ranged from 101 and 119 in Portsmouth and Brighton, to 215 in Sunderland, 226 in Preston, 227 in Leicester, and 228 in Bolton.

The death-rate from diseases of the respiratory organs, judged by the metropolitan returns, was below the average during October. The weekly number of deaths referred to these diseases in London averaged 264, and the annual death-rate was equal to 3·4 per 1,000. In Liverpool the annual rate of mortality from these diseases was last month equal to 5·6 per 1,000.

The causes of 361 of the 17,223 deaths registered in the twenty-eight towns during the five weeks of October were not certified, either by medical practitioners or by coroners. These uncertified deaths were equal to 2.10 per cent. of the total deaths, which was below the average percentage in recent months. In London the proportion of uncertified deaths did not exceed 1.03 per cent., while it averaged 2.85 in the twenty-seven provincial towns, and ranged from 0.00 to 0.99 in Derby and Portsmouth, to 4.82 in Sheffield, 5.00 in Salford, and 5.12 in Liverpool.

Among the population living in the outer ring of suburban districts around London, estimated at rather more than a million persons, the annual death-rate during October from all causes was equal to 15.1 per 1,000, against 15.2 and 14.3 in the corresponding periods of 1882 and 1883. During the five weeks ending the 1st inst., 51 fatal cases of small-pox, 48 of diarrhoea, 31 of diphtheria, 26 of whooping-cough, 22 of measles, 19 of fever, and 16 of scarlet fever were recorded in the outer ring. These 213 deaths were equal to an annual rate of 2.1 per 1,000, which exceeded that recorded in the corresponding month of either of the two preceding years. The fatality of whooping cough and diarrhoea declined, but that of each of the other zymotic diseases showed an increase. The 51 deaths from small-pox registered in the outer ring were all recorded in the district of West Ham, and included 15 of London residents registered in the Metropolitan Asylum Hospital at Plaistow. Four fatal cases of diphtheria occurred in Tottenham sub-district.

NOTIFICATION OF INFECTIOUS DISEASES.

In the table on page 225 are published uniform statistics of sickness and mortality in twenty-seven of the thirty-nine sanitary districts in England and Wales wherein the notification of infectious disease is compulsory. The estimated population of the twenty-seven towns for which we are enabled to publish complete statistics for the month of October is about two-and-a-half millions of persons. The annual rate of mortality from all causes per 1,000 persons estimated to be living in these towns, which in the three preceding months had been 19.53, 23.41, and 22.55, further declined during October to 20.51. This decline in the death-rate was principally due to the decreasing prevalence of diarrhoeal diseases. In the twenty-eight large English towns dealt with by the Registrar-General in his weekly returns, the death-rate during October averaged 20.50 per 1,000, which was slightly below the mean rate in the twenty-seven towns in the accompanying table. The rates of mortality were last month considerably below the average in Barrow-in-Furness, Lancaster, Burton-upon-Trent, Edinburgh, Leek, and Halifax, while they showed an excess in Bolton, Blackburn, Accrington, and Preston. The death-rate from the eight infectious diseases dealt with in the table averaged 0.98 per 1,000 in the twenty-seven towns which furnished this information, and showed a considerable further increase upon the rates recorded in the two preceding months, which were 0.54 and 0.77 per 1,000 respectively. No death from any of these diseases was returned in Macclesfield, Reading, or Warrington, and only a single fatal case in Burton-upon-Trent, in Lancaster, and in Leek; while they caused the highest rates of mortality in Greenock, Hartlepool, Preston, and Derby. Small-pox caused 3 deaths in Birkenhead; scarlet-fever was proportionally most fatal in Rotherham, Greenock, and Preston; diphtheria in Dundee and Greenock; and enteric fever in Birkenhead, Blackburn, Preston, and Derby. Two deaths were referred to puerperal fever in Bradford. With reference to the notified cases of infectious diseases, it appears that the proportion of the population reported to be suffering from one or other of the eight diseases was 7.92 per 1,000, against 4.07 and 6.85 in the two preceding months. Only one

case of any of these eight diseases was notified in London during October; in the other towns the proportion per 1,000 of the population ranged from 3.60 in 3.81 in Accrington, and 3.89 in Stalybridge, to 11.41 in Rotherham, 13.28 in Greenock, and 32.02 in Derby. The exceptionally high rate in the last-mentioned town was due to an epidemic of typhoid fever, no less than 206 cases of this disease being notified during the month. Thirty-two small-pox were notified in Birkenhead during the month. Scarlet-fever showed the largest proportional increase in Edinburgh, Derby, Reading, and Rotherham; typhus in Aberdeen; and diphtheria in St. Greenock, and Dundee. Five cases of relapsing fever were notified in Halifax during last month.

SPECIAL REPORTS.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

T. ORME DUDFIELD, M.D., *President*

A MEETING of the Society of Medical Officers of Health was held on October 17, 1884.

Mr. Hugh Stott, medical officer of health for Barnet, was elected a member of the society.

Dr. Frederick East, of 2 Clapton Square, E. was elected an associate of the society.

The president delivered an inaugural address on the subject of 'The Sanitary Administration,' which will be published in the SANITARY RECORD of Dec. 15.

At the conclusion of the address, on the motion of Mr. Bristowe, a unanimous vote of thanks was accorded to Dr. Dudfield for his valuable address.

On the motion of Mr. Shirley Murphy and Mr. Corner, it was resolved that the address should be printed and that a copy should be sent to each member and associate of the society, to the Local Government Board, and to each metropolitan local authority.

The president then proceeded to present to the society, in the name of the society, a copy of a resolution adopted at a meeting. The resolution was as follows:—

'At the annual meeting of the society, held on October 18, 1884, a letter was received from Dr. J. Northcote Vinen, resigning his office of honorary secretary, which was unanimously resolved that the resignation be received with regret and that the best thanks of the society be tendered to Dr. J. Northcote Vinen, M.D., for the long and valuable services which he has devoted for a period of more than twenty years with manifest advantage to the interest of the society. By these presents the society desire to express to him their warm appreciation of his labours and sincere wishes for his future welfare and prosperity. In presenting this testimonial, the president read a brief *résumé* of the progress of the society since its foundation in 1856. He believed that of those present, Dr. Vinen, Dr. Bristowe, and Dr. Conway Evans were the only original members; in 1863 they had 17 metropolitan members and 17 other members, in 1884 there were twenty years ago. The association now numbered 210 members, and by the list laid before them that evening he believed the number would be 210 at the next meeting. All due in great measure to the excellent services rendered by Dr. Vinen, who he regretted was now retiring from the society. He had held so long. He knew every one would join him in sincerely hoping that they would long have Dr. Vinen amongst them as a member of the society.'

In acknowledging the testimonial, Dr. Vinen said that the society had placed him in a position of considerable difficulty, for he did not know how to thank them adequately for the handsome way in which they had been enough to acknowledge any services he might have rendered.

A paper was read urging that it be made compulsory for labourers who were liable to have chips fly in their eyes to wear mica glasses, as is done in Germany. Another paper advocated the use of hospital cars on railways to prevent contact with contagious diseases. In the president's address, organisation was said to be the one thing needful in municipal sanitary reform. In a paper giving some results of a sanitary inspection of the schools in the state of Indiana, it was stated that forty-seven per cent. of the yards were not fenced, in 14 per cent. stagnant water was standing, and 30 per cent. of the school-houses had no proper means of ventilation. A paper was read urging cremation as a safeguard against epidemics. One of the most

portant papers was by Dr. Henry G. Baker, the secretary of the State Board of Health of Michigan, entitled, 'The Relation of Depth of Water in Wells to the Causation of Typhoid Fever.' For a series of years the doctor has collected data concerning the depth of the ground water in this State at many different points. These data he has compared with the records of meteorological conditions, and with the records of sickness from typhoid fever. By his comparison he showed that deaths from typhoid fever were in many cases coincident with the low state of the ground water, and that these occur in very warm or very cold weather. From the evidence he believed that there was a relation between these conditions. The serious evacuations from cases of severe diarrhoea are probably the direct cause of typhoid fever, and in Michigan the fever increases every autumn immediately after periods when diarrhoea prevails extensively. A study of the relation closets bear to wells will reveal the cause, for when there is a low state of the ground water, there is a tendency for the fluids from the closet-vault to flow down into the well or water near the well. The dilution of water in wells when the ground-water is high explains the decrease of typhoid fever at those times. Typhoid fever can be prevented by stopping drinking contaminated water. Mr. Henry Lomb, of Rochester, made a donation of 2,000 dollars to the Association to be given in prizes next year for the best essays on the following subjects. Healthy homes and food for the working classes; the sanitary conditions and necessities of school-rooms and school life; on disinfectants and individual prophylaxis against infectious diseases; appliances and means for saving life and for protection against injurious influences of some work and occupations on health. Prizes of 500 dols. each. The essays to be the property of the Association and to be ready April 5. The new officers elected were as follows: James E. Reeves, M.D., of Wheeling, West Virginia, president; Hon. Erastus Brooks, of Richmond, New York, first vice-president; Dr. Henry B. Baker, of Lansing, Michigan, second vice-president; Dr. J. Berrien Lindsley, of Nashville, Tennessee, treasurer; and an executive committee of six. The next meeting will be held in Washington in December 1885. There was a meeting of the Conference of State Boards of Health at St. Louis on Oct. 13 and 14, separate from the Health Association. The most important work it accomplished was the adoption of a report on the subject of cholera, which stated that the three essential factors to prevalence of cholera in this country as an epidemic are the importation of the disease by means of ships or less directly from its only place of origin in India; unsanitary conditions favourable to the reception and development of the disease; persons sick with the disease some of its stages, or things infected by such sick persons, to carry it from place to place. It further recites that, although State and local boards of health were never well organised as now, yet if cholera once secures a hold in the country, inland quarantines are not easily successfully maintained. In view of a threatened invasion of cholera, and the constant danger from other causes, Congress is asked to maintain a system of medical attachés to all foreign ports where contagious diseases are liable to exist. As the Canadian provinces are so closely allied to the States in the danger, some system by which both countries may be uniformly protected is urged. It recommends prohibition of immigration from infected countries; it asks Congress to appropriate 500,000 dols. to be used in stamping out the disease and preventing its spread from State to State; and sanitary work is urged upon all cities. The Conference will meet in Washington in December next, and hopes to impress on the Government the importance of its suggestions.

The above sentiments being those of our leading health officials, it may be seen that cholera is fully expected in this country next year.

All seaport quarantine restrictions will be removed on Oct. 31.

An effort is being made—a very weak one, however—to have a sanitary exhibit at the great cotton and industrial exposition in New Orleans, which is soon to open.

THE TYPHOID EPIDEMIC AT KIDDERMINSTER.

THE outbreak of typhoid which has during the last few weeks wrought so much devastation in the busy little town of Kidderminster, continues to excite much attention from the medical and sanitary authorities of the district, and much uncertainty still prevails whether to attribute it to a contaminated water-supply, or to contagion arising from the escape of sewer-gas containing fever germs into the streets and into the houses. Up to the time the medical officer's monthly report for October was made up, there had been seventy-four deaths from the disease, forty-seven having occurred during the previous four weeks, while something like 800 cases have been reported. The mayor (Mr. D. W. Goodwin) declined to comply with the requisition which, as stated in last month's issue of the SANITARY RECORD, was presented to him to call a town's meeting to consider the question, and an open-air meeting was consequently held, at which his conduct in the matter formed the subject of criticism. A proposition was made to the meeting fully approving of the action of the medical men in the town in condemning the water-supply from the lower well, at the sewage pumping works, for use for domestic purposes, and this was passed, an amendment calling upon the Corporation to close the well and sink others in the upper parts of the town being lost. Another resolution was moved and seconded to the effect that the meeting was of opinion that the members of the Corporation had been too fully occupied in acquiring property of doubtful value, and had devoted too little attention to the health of the town. But it was not carried, an amendment being passed declaring 'that the members of the Corporation had done the best they could to stop the epidemic.' Dr. Parsons, the Local Government Board inspector, has paid a second visit to the town during the month, and has instituted a searching investigation into the sanitary condition of the place, making in some parts a house-to-house visitation. He also received a deputation of the townspeople, and suggested to them the advisability of forming a sanitary association or vigilance committee, with a view to assisting and strengthening the hands of the council. Some voluminous correspondence has also taken place on the subject in the local papers, from those who do and from those who do not understand the question. Mr. J. E. Stone contends that the water both from the upper reservoir and the lower well has been cleared from blame, that the 'sweating' from the sewage-pipe running close to the lower well was practically nothing, and that the outbreak is to be attributed to an intermittent rather than a polluted water supply, allowing sewer-gas to be sucked through the sink-traps into the pipes, where it contaminates the water when the latter is again turned on. His theory is an ingenious one, and as it bears out the only practicable solution that has yet been arrived at—viz., that sewer-gas is in some way to blame for the epidemic, it attracted a good deal of attention. It has to be remembered, however, that sewer-gas in itself, unpleasant and noxious as it may be, will not produce typhoid; nor would the quantity that would get into a house in the manner Mr. Stone suggests be sufficient to account for the widespread and serious nature of the outbreak. Dr. Horace Swete, medical officer at Droitwich, while agreeing with Mr. Stone in his main contention that the mischief was caused through the pollution of the water-supply with sewer-gas, applies the theory in a more practicable manner. Typhoid excreta have, he understands, been passing through Kidderminster sewage-pipes for some months past, so that there has been no dearth of germs, whilst the great heat of summer caused gas to be largely formed. This gas would easily carry with it these germs, which are infinitesimal in

size, and convey them into drinking water by suction where the water and sewage-pipes are laid side by side, or with pebbly or porous soil between them, it being difficult to over-estimate the power of suction into a water-pipe when a vacuum has been formed in it. Or it might, and more probably, where the bend of the soil-pipe entering the drain and the iron bend of the water-pipe are in close connection, escape from the former and be received into the latter by suction. Or, again, it might be conveyed where cottage valve-taps are used to supply water-closets. With reference to the water-supply from the lower well—the situation of which and its surroundings led to its being condemned at a very early stage of the outbreak as the probable source of contagion, notwithstanding that the water had been certified pure and good—Dr. Swete reports that it is an artesian bore nearly 200 feet deep, and gives it as his opinion, founded upon facts which he sets forth at some length, that no typhoid excreta had passed into the well from the sewage-pipe adjacent to it; but that the cause of the disease must be sought for in some local disturbance affecting the main which supplies Kidderminster alone, water from the same well having been supplied both to Stourport and Upper Mylton without prejudicial results. Speaking at a meeting of the burgesses held a few days since in connection with the municipal elections, Mr. Councillor Roden, son of the late Dr. Roden, for many years one of the local medical officers, gives an opinion in a similar direction. He considers that the medical officer of health (Mr. D. Corbet) was not far wrong when in the first instance he attributed the outbreak to sewer-gas. 'There can be no doubt,' he remarks, 'that the sewers are faulty in construction in many places, and this, added to the great want of proper ventilation, causes the gas to force its way into the houses.' If it be a fact, as has been stated, that other parts of the district have been supplied with water from the lower well, and were so being supplied at the time the disease broke out, without causing typhoid in those places, it goes largely to support the analyses as to the condition of the water, and the opinion of experts that the cause of the epidemic does not lie in the well. This is further borne out by a recent analysis of the water made by Mr. E. T. W. Jones, county analyst, of Wolverhampton, who certified that he 'considered the water free from the least suspicion of any hurtful contamination, and of a perfectly satisfactory character for drinking.' A wrought-iron pipe has, however, been placed in the bore to the depth of 40 feet and hermetically sealed, and the pumps are placed at the top. At the monthly meeting of the Town Council, held on the 29th ult., a long discussion took place upon the matter. As showing that the water at its source was not contaminated, the town clerk mentioned that Dr. Franklin had analysed samples of water taken from two houses in the town in which there had been cases of typhoid fever, and in both instances the water was certified as being 'perfectly good.' The medical officer reported a death-rate for the previous four weeks of 46·901 per 1,000, against 11·215 for the corresponding month last year. Of the total 92 deaths, twelve occurred under one year of age, ten from one to five, thirteen from five to fifteen, twenty-eight from fifteen to twenty-five, sixteen from twenty-five to sixty, and thirteen above sixty. He stated that however much flushing and disinfection of the sewers might be carried on by the authorities, it would be of little avail without the assistance of the owners of small tenements, or their agents, as well as the tenants themselves, in taking care that all overflow and waste pipes were disconnected, the drains were properly trapped, and middens kept in proper repair. In many cases he found that the down spout from the roof was in direct communication with the sewer, thus becoming a ventilator. But as the joints of such spouts were in many instances imperfect, the sewer-gas escaped into the houses. As to the cause of the epidemic, so far as his inquiries enabled him to form an opinion, he held it

was caused by sewer-gas, in conjunction with the drains. There was plenty of cause for the outbreak this, for when once the drains became contaminated the excreta from fever patients, there was nothing to prevent its spreading, especially as they had no means of disposing of isolating the patients. It was undecided at this meeting of the council that the latter should again be put into use for supplying the town. It was also reported that forty-eight ventilating pipes had been placed in the sewers, and that thirty more were fixed that day. In order that the sanitary work of the borough may be more effectually looked after, it was decided to appoint an assistant inspector of nuisances at a salary of 35s. per week. The authorities appear thoroughly alive to the responsibility that rests upon them, and to be endeavouring to make up for any omission they may have characterised their action on sanitary matters in the past by increased activity in the future, which will bear fruit in the increased healthiness and cleanliness of the town, as well as in securing it from the possibility of any further outbreaks of the nature of that from which it has not yet recovered.

THE PLUMBERS' CONGRESS.

THIS Congress was opened on Oct. 20 at the Institute, South Kensington, under the presidency of George Shaw, Master of the Plumbers' Company.

The Chairman, in commencing the proceedings, referred to the old ordinance of Edward III., which nearly a century ago directed that the whole of the subjects they were to discuss, should be such as they should endeavour to discover means by which the public would be protected from the serious evils arising from defective plumbing, by enforcing responsibility against those doing bad work. This could only practically be done by establishing a standard of excellence in work and material. He hoped that the resolutions would tend in this direction. The Council of the Plumbers' Company were fully disposed to take the matter; and it was satisfactory to find that a general movement was taking place.

Mr. Ernest Hart read a paper which will be published in the next issue of the *Record*.

The first subject for discussion was—

THE TECHNICAL INSTRUCTION OF PLUMBERS.

On this subject Mr. W. Eassie, C.E., read a paper in which he contended that plumbers were often to be found having fallen from the high position which they occupied in ancient times. The healthy conservatism of the trade had degenerated into unhealthy radicalism; manual skill was not sufficient to make a finisher, and he would not honour with the name of a craftsman the mere use of tools. It was to be regretted that the bulk of the literature of the trade had been of an elementary character. In his opinion a technical education of plumbers should consist not simply of the use of certain metals for certain purposes, but of a knowledge of why they were so used. It should consist of being able to sketch in minute detail the appliances; and of not only being able to erect them but also to measure it up. There should also be a knowledge to tell whether work would fail if done in the manner directed, and to provide a remedy for defects and clerks of works were sometimes to be found dealing with plumbing work, and showed a complete lack of technical knowledge. The inexperienced plumber specified that a soil-pipe should be fixed in a certain house, when it was usually to be found on the other side of the street; the clerk of works passed it; the builder erected it; the surveyor measured it up; and yet the arrangement was a failure. It was necessary that the plumber should be a man of knowledge, and that he should be able to continue until the status of the trade was raised, and until the plumber reached a stage which would enable him to become a teacher of his craft, and to ref

work. The manual education of the plumber secured during his apprenticeship, and much work learned besides, but there was a great want of technical education, and the question was how this might be imparted. It must be derived more or less from the State. The mere seeing and handling of lead would not impart all its properties and applications, any more than the dissection of the bones taught the practice of surgery—the institution of the City and Guilds Institute, and various technical schools. There should be not only a written but an oral examination, besides a practical demonstration of the capabilities of the metals. He would like to follow more or less closely the system of the National Health Society in the plumbing course inaugurated by Mr. Shaw; and would accord in the first year to any but those who passed the examination the commendable credit. It would repay the plumber for coming a long distance to receive such a certificate, as it would place his thorough competency beyond

T. Mills (of the Technical College, Finsbury) spoke on the same subject, in which he urged that the education requisite for the plumber of the future should be divided into the following heads. Mechanical work of the trade; practical work of the trade; and theory of the trade. Under the first head he would include technical geometry appertaining to the trade, in-tern-cutting, or the development of surfaces, making of working drawings from dimensioned objects, to be done by the student from models of appliances and fittings. The second head in-cluded manipulation of sheet-lead, elementary sheet work, and instruction in the various kinds of joints; the third head comprised instruction in the physics of the trade, with laboratory work, by the aid of lectures and experiments. This latter would include the properties and alloys, the composition of solder and the action of air and heat on molten metals. It might be expected that men who had reached middle age and had family or other ties, would take up the instruction put forward by him as needful for the plumber of the future. By the very words 'of the young men' were necessarily indicated, and it was no heavy call on a young man to attend a course of instruction spread over (say) two years. When this was done, a plumber would be as much trusted and he had been abused of late years.

V. Clarke, a teacher of plumbers' work under the City and Guilds Institute, read a paper in which he stated that the meaning of technical education was not understood by the London plumbers. No man could learn a trade by reading books or attending lectures. Education, as commonly understood, was not experience, and would never take its place. At the time it was often asked, what was the good of a technical education? It might as well be asked, the good of brains? The plumber who knew of the nature of the metals he used would take care of protecting the public from injurious and noxious matters, and would know what should be done for each special purpose. A knowledge of hydrostatics, however elementary, was of great value to the plumber. He had never known an architect who gave detailed drawings for the plumber to do the remedy for this was that the plumber should state himself, so that the architect would have to advise with him personally. The plumber should know how to make drawings, so as to be able to refer to those in authority. It was necessary also that he should educate himself to prevent his being pushed aside by sanitary engineers. The best solution of the problem was the establishment of trade scholarships. The munificence of the rich City companies, should be opened in any place where a few plumbers gathered together; but the plumbers themselves had not been the subject as they might.

Mr. E. G. Mawbey (Borough Surveyor of King's Lynn), in a paper read by him, stated that it was frequently found more difficult to convince the plumber than the owner of the necessity for modern sanitary arrangements. Plumbers, instead of opposing, should, in their own interests as well as for the benefit of the public, support the suggestions of experienced surveyors and sanitary inspectors. There was not so much difficulty in securing the technical education of plumbers in large cities and towns as in small towns and districts. This might, however, in the latter cases be effected to a great extent by holding plumbers' district meetings for the reading and discussion of papers, and the medical officers, local surveyors, and sanitary inspectors might be invited to take part therein, and the papers, &c., printed and circulated. The example of the Sanitary Institute might with advantage be followed by instituting examinations for plumbers and granting certificates to competent men.

In the discussion which followed,

Mr. Smeaton (London) maintained that the plumbers knew very well what they had to do. They had to get a living. A specification was put into their hands by a person who knew little about plumbing. The plumber was ordered to carry out his instructions and to mind his own business. The honest plumber was too often put on one side, and any one who could write on sanitary science came to the front. Competent plumbers only should be employed in connection with technical instruction for the trade.

Mr. P. J. Davies (London) said that what was required was a number of duly registered instructors of the plumbers' trade. There should be an examiner in each district, and then there would be no difficulty in getting good plumbers. He was certain that members of the craft would never tolerate licences.

Mr. W. P. Buchan (Glasgow) contended that no man could learn the plumbing trade out of the shop. When a journeyman he had often to refuse to answer the questions of clerks of works, when under the master's order he had put on 5 lb. lead piping instead of 6 lb. lead. A knowledge of drawing lay at the root of the whole question of the education of the workmen.

Mr. Matkin was in favour of licensing plumbers.

Mr. Scott-Moncrieff (London) thought that the meeting should do something in the way of passing a resolution in favour of technical education. The day had nearly gone by when any plumber could take refuge under the failure of other tradesmen in connection with the sanitation of a house.

Mr. Humphrey (Nottingham) considered that plumbers' work was not of the offensive character that should necessitate its being buried out of sight. The work should be open for inspection, and be thoroughly good work of its kind. The architect should be the ruling spirit in building work, but he should consult the men who had devoted their lives to particular branches of trade.

The chairman here suggested that some such resolution as the following should be passed:—

'That, in the opinion of this Congress, it is desirable that in future architects should not include plumbers' work in builders' contracts.'

This was received with great applause, and was proposed by Mr. Clutterbuck, who said they had a right to protest against builders taking every kind of business in hand. Contracts should be divided, and so should the responsibility. The plumber would then receive 10 per cent. more for his work and the public be better served.

Mr. Firth (Kensington) seconded the resolution.

Mr. F. C. Penrose (architect) expressed his adherence to the separation of the plumbing work from builders' contracts.

Mr. Lane opposed the resolution, believing that divided responsibility would end in no responsibility.

Mr. Wandsborough contended that the action of the architects in including plumbers' quantities in building contracts had done more than anything to damage the

trade. The architects would be serving the public better by conferring with practical men in their various spheres of work. If the work were divided it would open up facilities for the development of education, which masters at present could not afford to carry out.

The resolution was carried with one dissentient.

The next subject discussed was :—

'APPRENTICESHIP, THE DURATION AND CONDITION OF INDENTURES SUITED TO THE PRESENT STATE OF THE PLUMBING TRADE, AND TO THE MODERN SYSTEM OF TECHNICAL INSTRUCTION.'

Mr. W. R. Maguire (Dublin) read a paper, in the course of which he said that the apprenticeship of plumbers should not be reduced to a shorter period than seven years, as of old time. The object should be not so much to induce apprentices to come in, as to insure that when they went out they should take with them a well-taught, well-learned, and well-practised handicraft for public benefit. Payment to apprentices should be formed more in accord with their value to their masters, than was now the case. Even if paid little in the first year, there should be a tangible payment and steady advance of wages year by year. Employers being as different in character as workmen were, the Congress might frame some suggestions on the subject which would be accepted as a good guide by both employer and employed.

Mr. Frederick Fell (Worcester) followed with a paper on the same subject. Never in the history of the mechanical trades had so great a necessity existed for an apprenticeship of long duration and strict in its terms. Where the master confined his business strictly to plumbing, all that was needful might be learned in six years. He would like to see introduced into the indentures clauses compelling the apprentices to attend classes at properly constituted Science and Technical Schools, and to pass at least two examinations during their term. The first of these should be simple and mainly practical, and the second one of a more searching character. No tradesman should be allowed to assume the responsible position of master unless qualified to be one.

Mr. Smeaton in a paper contended that apprenticeship should be for at least five years, the most suitable time for which would be between the fifteenth and twentieth year. One or two evenings a week should be devoted to the study of the theory of plumbing, including drawing, geometry, water supply, heating, drainage, and the roofing of dwellings. The apprentice must be allowed, by mutual consent or arbitration, to have one master, and finish his term with another for the purpose of improving his knowledge of the trade. It would also be well if the indentures were endorsed as to the conduct and ability of the apprentice.

Mr. Scott-Moncrieff thought that five years would be a good period, with perhaps another two years as a term of probation in other workshops. He moved :—

'That, in the opinion of this Congress, it is desirable that the apprenticeship system should be continued, and modified, if necessary, to suit the improved course of technical education.'

This was seconded by Mr. Stolder, and agreed to.

The third question discussed was,

'THE ESTABLISHMENT OF METROPOLITAN AND PROVINCIAL BOARDS OF EXAMINERS OF PLUMBING WORK.'

Mr. P. J. Davies opened the subject with a paper, in which he advocated that a Metropolitan Board of Plumbers should be established, with head-quarters at the offices of the Plumbers' Company. The duty of the Board would be to examine plumbers both in theoretical and practical plumbing, and to grant to successful candidates a certificate and registration, which latter should qualify for the office of district examiner of sanitary plumbing work. If necessary, sub-committees should be established in large provincial towns to carry out the work in uniformity with the laws and regulations established by

the Metropolitan Board of Plumbers, or by Parliament. The committee should be made up of certificated plumbers.

Mr. E. Knight (Southwark) maintained that by the establishment of such boards, owners of houses would obtain certificates as to the proper sanitary condition of their dwellings. The advantage of this was manifest in connection with the letting and selling of houses, and it would at once strike at the root of defective sanitation. The Board of Examiners should, if possible, be invested with some local authority, and should at all events hold a well-defined and acknowledged position. They would work in connection with the parochial authorities, being careful at the same time not to usurp the duties of the inspector of nuisances. The charge for reports should be a small one. A board might be formed in the first instance from members of the Court of the Plumbers' Company, assisted perhaps by one or two professional gentlemen.

In the discussion which followed, Messrs. Moore, Underwood, and others took part. Mr. Vacher proposed :—

'That this Congress is of opinion that in the event of the establishment of Provincial Boards of Examiners of Plumbing work, such Boards (firstly) should be affiliated with a Metropolitan Board; (secondly) should consist chiefly of trained working plumbers; and (thirdly) should be in connection with the provincial schools of plumbing.'

Mr. A. B. Clarke seconded the resolution, which was carried. The fourth subject was,

'THE REGISTRATION OF JOURNEYMAN PLUMBERS.'

Mr. R. Smith (Bermondsey), who read a paper, was opposed to the proposed registration, as it would open up a field for many abuses, and ultimately do great harm to the trade. Any board of examiners would consist largely of members with theoretical qualifications, and such a class of judges would in time exclude the practical men. There were means in their midst for obtaining properly-qualified plumbers, viz., the trade societies. There was a prejudice against these, but he would ask what were the Plumbers' company and the other guilds but trade societies? Plumbers were the only competent judges of plumbing, and the young man who joined a trade society had the benefit of the experience of the older workmen.

Mr. Smeaton advocated the granting of some such certificate as was given in America.

Mr. Houghton thought that if the masters were registered first it would have the effect of keeping linendraper and others from undertaking plumbing work.

The Chairman remarked that the registration would be a mark of high honour, showing that the person registered was a competent craftsman.

Mr. Swales said that in Melbourne plumbers had to pass an examination.

On Oct. 21 the following resolution, in continuation of the previous day's business, was passed :—

'That, in the opinion of this Congress, the registration of master plumbers and journeymen plumbers is expedient.'

Mr. Webb read a paper on—

'THE SUITABILITY OF MATERIALS USED IN PLUMBING, AND PARTICULARLY THOSE MATERIALS RECENTLY INTRODUCED AS SUBSTITUTES FOR LEAD.'

There was, he said, no known substance to equal lead for wear. Properly laid, not condensed, well dripped, and with all the expansion possible, he contended it was the best. But they must adapt themselves to circumstances. In model dwelling-houses, with drying-grounds at the top, it would be entirely out of place to use anything else but asphalt or cement and coke breeze. Turning to another substitute—viz., zinc, although much improved in the laying, it had no superiority over lead, being a hard metal without expansion, and liable to crack from the action of the acid in the process of soldering. With regard to cisterns he gave the preference to galvanized iron ones. In lead cisterns, and especially in certain districts, the action of water affected the weakest point of the cistern—viz., the outside of the soldering, and when

is not frequently cleaned out small portions were liable to be imported into the system; as a substitute, would not stand the test; and in cleaning them out a slimy vegetable grew to the sides, and there was a liability to vibration. With respect to soil-pipes he gave out to lead, and asked whether it was possible to make a joint with iron lasting for any length of time would occur in the cement of the joint, and would exude. Turning to the question of good-looking pieces of porcelain had been out these were complicated in construction, from a sanitary point of view. He still adhered to the closet adopted by Bramah, but very much for all private dwellings where supervision was very old servant, the pan-closet, had been out of date. Though long since condemned, it was in large extent in use, and would live as long as the temporaries as a hard-wearing closet.

In a session which followed, Mr. F. Wells (Worcester) opened the question of—

He said he considered the ordinary pan-closet the best thing in buildings. Mr. F. Wells affirmed that no cistern should be left for three months without cleaning. Mr. F. Wells was not opposed to iron soil-pipes if they were sound. Iron and lead pipes did not always differ; in a comparatively short time there was a difference in the joints, and the foul air would escape. The Court thought that plumbers should be left to their discretion very much as to which was the best material to be used.

Mr. F. Wells believed there was a great opportunity to push lead as against zinc. For internal use, good strong lead was the best, fitted neatly

Mr. F. Wells remarked that glazed earthenware was suitable in country districts.

Mr. F. Wells was of opinion that lead was the most suitable for soil or any other pipes, because good and the action of any amount of acids or salts would not believe glazed earthenware used in water-works would last more than twenty years. He was of opinion that the lead piping of the ancient conduit was and which was as good as on the day it was made. In the case of Glasgow the engineer would allow anything but lead to be used for the water pipes except for the large mains. He believed that lead was the best material.

Mr. F. Wells (Glasgow) read a paper on

THE LIABILITY OF FIXING UPON A SYSTEM BY UNIFORMITY IN THE QUALITY OF MATERIALS IN PLUMBING MAY BE INSURED.

Mr. F. Wells had the idea of enforcing uniformity in the work in plumbing was not new, as articles in the water supply of London and Glasgow bore an official stamp. No regulations, however, of the materials or soil-pipes. The practice in cast-iron rain-water pipes inside houses, was to do duty as soil and waste-water pipes, and was prohibited. In many cases it was customary to use hot-water waste-pipes for baths and wash-rooms soil-pipe for the closets. This was a bad thing; the soil-pipe to stink worse than with only iron through it. In addition to this, condemning the practice, he objected to the way in which their joints were made—viz., by merely plastering a little over the top of the joint. When the joints were made and run with lead or sulphur they should be made with red lead, and the joints made with hemp and lead and twisted round the spigot end of the pipe in position the hemp should be rammed down the joint run full with red lead.

In a session which followed, Mr. W. R. E. Coles said at a standard of the quality of materials used upon, to be specified in the tender.

An extra paper by Mr. Poole, of Norwood, on the same subject having been read,

Mr. Tidmas proposed,—

‘That the Congress is of opinion that it is expedient that the system of sealing or marking lead and solder of standard weight and quality be revived by the Plumbers’ Company, and that the Plumbers’ Company should be requested to consider whether the materials used in plumbers’ work as substitutes for lead are suitable, and whether standards of quality for such materials could be advantageously fixed on and verified by a recognised mark.’

Mr. Smeaton seconded the resolution, which was carried.

Mr. F. Wells (Worcester) opened the question of—

‘THE FORMATION OF DISTRICT ASSOCIATIONS OF PLUMBERS TO INVESTIGATE AND SECURE, AS FAR AS PRACTICABLE, CORRECTION OF EVILS AND ABUSES ARISING IN CONNECTION WITH THE TRADE.’

He said that if the formation of such associations would correct the evils of insanitary plumbing it would be a strong argument in their favour, and would effect a lasting good. Insanitary plumbing was the cause of a great amount of illness and death, and yet this sort of work was not only accepted, but sought after on the plea of cheapness. If district associations could be formed to correct these abuses, and carried on effectively, they would in the first place be the means of securing wholesome dwellings, and would give the honest tradesman his legitimate place in his trade.

Mr. Emptage (Margate) read a paper in which he said though much had been done through the labours of sanitarians and sanitary societies, it was small in comparison with what would be accomplished. Our American cousins had grappled ingeniously with the evils, and by the aid of a stringent plumbing law had almost regenerated the trade. In some places the law was carried out with great rigour, and he found that a plumber in New York was fined fifty dollars for putting in a dummy vent-pipe to a trap in the basement of a house; a master plumber was fined 150 dollars for allowing two dummy vent-pipes to be fixed; while another was fined 250 dollars for bad plumbing work in new buildings. An unregistered plumber lost the day in an action against a builder to recover his account for work done, because he was not registered, and was therefore working contrary to law. On the other hand, the permissive nature of our laws in regard to sanitary matters too frequently resulted in the presence upon our local boards of unscrupulous builders, and interested parties who used their position to silence the surveyor. The American law had been in force for more than three years, and seemed to work well. It protected the plumber to a great extent from dangerous competition, and enabled him to do honest work. There would be considerable difficulty in getting such a stringent law passed in England, but they might, with a good chance of ultimate success, aim at obtaining Parliamentary powers whereby all plumbing work in connection with sanitation would be carried out under the strict supervision of properly appointed and duly qualified persons, upon certain fixed and sound sanitary principles.

Mr. John Bailey thought it would be better to form associations to remodel their craft, than to allow it to dwindle into mere tinkering. He would call attention to the fact that the general public when they had cause of complaint against the trade were not aware that the plumbers did not design their own work, but were in reality carrying out other people’s ideas of sanitation. It was his opinion, after forty-five years’ experience, that it was necessary to form metropolitan and provincial associations, not simply for themselves, but for the registration of journeymen plumbers.

Mr. T. H. Court, in a paper, referred to the necessity which existed for an investigation of plumbers’ work. Architects in some instances, and the medical profession,

were now giving more time and attention to the laws of sanitary science than at any previous period. He was sorry to say he had been compelled to condemn a large portion of the work he had seen in different parts of the country. They would all agree that there was the greatest necessity existing for a thorough investigation of plumbers' work, for the correction of evils and abuses. This should be done by associations formed for the purpose. It would tend to raise a trade which was second to none in importance, for upon the plumber's work more than upon that of any other trade did the health of the nation depend. The associations should be composed of plumbers, as the work to be inspected would be plumbers' work.

Mr. Allan (Eastbourne) proposed :—

'That the resolutions and conclusions set forth in the preceding paper be referred to the Plumbers' Guild, with a request that they will confer thereon, with a view to take such action as may seem best.'

Mr. J. Murrell (Norwich), seconded the resolution, which was agreed to.

The Chairman, in summing up the work of the Congress, expressed the hope that it would result in the formation of a representative committee to carry out the recommendations and suggestions that had been made. He congratulated those who had attended the sittings on the practical character of the discussions, and the genial manner in which they had been carried on, and thought it would only be the beginning of what would be an ultimate and general success.

A cordial vote of thanks to the Chairman and to the Plumbers' Company closed the proceedings.

THE DUTY OF THE CHURCH WITH REGARD TO THE OVERCROWDED DWELLINGS OF THE POOR IN TOWNS AND IN THE COUNTRY.

THIS question was discussed at the recent Church Congress at Carlisle, when the Bishop of Bedford read the first paper, in which he spoke at some length of the past action of the clergy in their several parishes, instancing the work of such men as Mr. Quekett, Mr. Denton, Canon Girdlestone, Mr. Lowder, Mr. Billing, and Mr. Barnett. He also adduced the indirect influence of the clergy in promoting better habits among the people through education, they having been the pioneers in the work of national education. In answering the question—'What can the Church do to remedy the present evils?' the Bishop gave six answers—(1) By creating, directing, and keeping alive public opinion; (2) by enlisting and encouraging workers in the cause, such, especially, as the band of ladies working under the training and direction of Miss Octavia Hill; (3) by stirring up the owners of property to a higher conception of their responsibilities; (4) by teaching the people in all ways to care for better homes and purer surroundings; (5) by infusing among the people a spirit of self-help and enlisting them in the work of self-improvement and improvement of their homes and habits; (6) by fostering the great movements for the promotion of temperance and purity.

Major Rankin, M.P., said that it was the duty of the Church to endeavour to improve the dwellings of the poor and to lessen the evil of overcrowding in every possible and legitimate way. The Church could work by private effort, both individual and combined. The clergy might be most useful in the cause of stimulating every effort at self-help in the way of cottage building societies or Starr-Bowkett societies. It was a legitimate and rightful use of the pulpit for any clergyman to give his parishioners sound and useful advice therefrom on this question. Much had been done by individuals and companies to rebuild and improve insanitary dwellings and to offer them to the working classes at low though remunerative rents. In this kind of work it was within the power of nearly every one to do something. It was the duty of the Church to

stimulate efforts of this kind, as if bad property were to pass into the hands of kind and Christian owners, one great part of this difficult problem would be solved. It would be a work worthy of the Church to establish dwellings to meet the wants of the very poor by having one or two room tenements; and the establishment of cheap club or table d'hôte dinners in connection with such dwellings would be worthy of benevolent people. As to legal remedies, the Church ought to urge the constituted authorities to take action when required, for if that were done an immense step towards the rooting-out of overcrowded areas would have been taken. The country was over-populated, and the only effective remedy was to cut off the supply of persons who now annually immigrate into our large towns from the country. The Church and the clergy could do a great and beneficent work by endeavouring to direct the stream of emigration from the country districts to our colonies rather than to our towns. We might establish industrial schools for the reception of poor children, either orphans or the children of vicious parents, with the object of training them for colonial life, and then sending them out to homes in the colonies.

The Rev. James M. Wilson, M.A., head master of Clifton College, said he advocated these principles :—That it is the duty of the Church (1) to influence opinion by collecting facts about the dwellings of the poor; (2) to urge its members vigorously to promote improvements in the material conditions of life among the poor; (3) to set an example by the expenditure of capital in ways not directly remunerative on the improvement, where desirable, of dwellings on Church property. He made the following recommendations :—That in the country sanitary associations be formed in each rural deanery to call attention to this and cognate subjects, and to collect and diffuse information as to facts and causes and legal remedies; that in each large town a committee—not limited to professed members of the Church of England—be invited by the bishop to assist him in an inquiry into the conditions of life of the very poor. A valuable precedent for this may be found in the city of Bristol. That a searching examination be made by the bishop in each diocese, or by some commission appointed by him, as to the condition and occupation of houses on the glebes and Church property in general. Some precedent for this may be found in the diocese of Lichfield. That the Houses of Convocation in both provinces be requested to collect and summarise for publication evidence on overcrowded dwellings and their effects on the moral condition of their inhabitants. The valuable report on intemperance will occur to all as a precedent. That the trustees of Queen Anne's Bounty be requested to advance money not only under the Dilapidation Act for necessary repairs; but, under proper conditions, on the report of some special commissioner appointed by the bishop for the purpose of improving cottages upon the glebe. 'Overcrowded dwellings (it is said) like all other unfavourable conditions of life among the very poor, are the result of the laws of economical science;' but the very *raison d'être* and genius of Christianity is, by the implanting in men of a new motive and spirit, to fight such economic and social laws as act against the highest interests of society.

Mr. William Inglis, of Leeds, President of the Church of England Working Men's Society, said respectable Christianity comfortably located in 'ceiled houses' could not dream of the fever dens, nurseries for disease, and centres of disaffection and discontent that almost touch it—the hideousness of the blind alleys and sunless nooks where the virtuous poor, the vicious poor, and the criminal classes are huddled together. In Leeds it was no uncommon thing to find five, six, and even more persons, many of them adults, and not always members of the same family, occupying one sleeping apartment. Many of these miserable and inadequate houses were those sanctuaries of civilisation—cellar dwellings. The same condition of things was to be found in the slums of every town. We

reached the climax in London, where 30,000 men, women, and children have not even the shelter of an overcrowded home, but sleep in casual wards, common lodging-houses, or hide away in any hole like beasts; and where 60,000 families, of from two to ten persons in a family, each lived in one room. The effects of this crowding were (1) the ruin of young men and women, who drifted into the public-houses, the music-halls, and the street; (2) the absence of home training, most of the children being brought up in the streets that surround the slums, well named the 'Devil's Kindergarten'; (3) the infant mortality, which in Southwark district amounts to 305 per 1,000; and (4) a vast amount of physical weakness and deformity. Looking for the cause he found it partly in the pulling down of the dwellings of the poor for street improvements. Why should we not have Societies for the Protection of the Poor? It was the duty of the Church to set such machinery in motion and invite the co-operation of Christians of all denominations.

The Rev. C. W. Stubbs contributed a paper, in which he described the deficiencies of cottages in villages in Bucks, which were in a miserable and ruinous condition. In one village none were in a sanitary condition, and many had but one bedroom. Capacity, water-supply, drainage, and surroundings all condemned the cottages as unfit for habitation, and such cottages were to be found in many villages. Better cottages could not be provided because labourers could not pay their rents, but allotments of land would enable cottagers to do so. We could not wait for the operation of the law of supply and demand, nor for the elevation of the individual standard of comfort; but permissive legislation must be made compulsory, and sanitary conditions must be enforced by the appointment of inspectors and of medical officers of health. The Artisans' Dwellings Act should be extended to the counties.

The Rev. G. P. Head, of Hatfield, Doncaster, said the landlords had not yet recognised the duty of providing cottages for those employed in tilling their land. In his district few cottages had more than one bedroom, and clergymen who moved in the matter were threatened with the stoppage of charitable subscriptions. They wanted in such districts the support of public opinion. There were noble examples to the contrary. All that was required was that those examples should be imitated. In the Isle of Axholme many cottages had far less than the minimum of cubic space for each sleeper, but these separate properties were preserved for the sake of the votes they gave. Employers of labour in towns and cities should do something to house those who made their fortunes.

The Rev. A. E. Humphreys, of St. Matthew's, Cambridge, said he had endeavoured to form companies to repair cottages and build cottages, and experiment had shown that the work could be done and leave a profit of 4 per cent. A popular book containing the experience gained in different parts of the city would stimulate effort in this direction. The work should be brought before the undergraduates at the universities.

The President referred to inquiries that were being made in Bristol and Hull which were likely to lead to beneficial results, and which should encourage the clergy and the laity to take the work in hand. The question would be forced upon us by the progress of compulsory education, which was impossible under the conditions that had been described. You could not improve houses unless you could get at the hearts and consciences of the people who lived in them, as was being done by Miss Octavia Hill and others.

FIRST ANNUAL REPORT OF THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS.

THIS association owes its existence in a great measure to the efforts of the able honorary secretary, Mr. Legg, of Hackney, and Mr. Lukes, of Gravesend, who first promulgated the idea of the association by letters sent to and inserted in the *SANITARY RECORD* of April 15, May 15,

July 15, 1883. These letters came under the notice of the Sanitary Institute of Great Britain through their secretary, Mr. E. White Wallis, who very kindly took the matter up, and advised and assisted in the matter of the arrangements for the preliminary meeting, which, owing to the courtesy of the members of the Sanitary Institute, was held in the rooms of that society at No. 9 Conduit Street, on June 9, 1883 (see *SANITARY RECORD* for June 15, 1883). In answer to some 150 circulars sent to inspectors in London and neighbourhood, about twenty members attended the meeting, which was presided over by E. C. Robins, Esq., F.S.A., a gentleman eminent in sanitary science, and who has always sympathised with and shown himself fully acquainted with the 'disabilities of inspectors of nuisances.' (See *SANITARY RECORD*, for Oct. 15, 1883, p. 176.) It was unanimously resolved that it was expedient that an association should be formed under the title of 'The Association of Public Sanitary Inspectors,' to which any inspector holding public office was entitled to become a member. It was also after some discussion resolved that anyone interested in sanitary science would be eligible to become an associate. A Provisional Committee of twelve of the inspectors present was formed to draw up a code of rules, and to make the necessary arrangements for starting the association.

The Committee met several times, and the first meeting was held on July 28, 1883, at the Holborn Town Hall (see *SANITARY RECORD*, Aug. 15, 1883). In answer to about 400 circulars, some forty inspectors met and adopted, with few alterations, the rules suggested by the Provisional Committee. The Executive or Council was elected from those present, and included the whole of the members of the Provisional Committee.

The following gentlemen have been nominated from time to time, and have consented to become honorary members:—J. Bristowe, M.D., LL.D., F.R.S., Dr. Bianchi, Professor W. H. Corfield, M.A., Edwin Chadwick, C.B., President, Dr. W. Collingridge, M.A., Brudenell R. Carter, F.R.C.S., T. Orme Dudfield, M.D., William Eassie, C.E., Capt. Douglas Galton, C.B., F.R.S., George Godwin, F.S.A., F.R.S., Baldwin Latham, M.Inst.C.E., James Lemon, M.Inst.C.E., Sir Robert Rawlinson, C.B., Dr. B. W. Richardson, F.R.S., E. C. Robins, F.S.A., J. W. Tripe, M.D., Lewis Angel, M.Inst.C.E., Dr. F. M. Corner, Dr. W. Johnson Smith.

At a later meeting the name of the present honoured president was proposed, and, in answer to the request of the Council, Mr. Edwin Chadwick, C.B., 'the father of sanitary science,' consented to become the first president of the association.

The Council have arranged to hold the meetings in future at the rooms of the Social Science Association, No. 1 Adam Street, Adelphi, Strand, London.

Monthly meetings have been held as follows:—On October 3, at the Holborn Town Hall, when Mr. G. B. Jerram (the chairman) gave his inaugural address. (See *SANITARY RECORD* for November 15, 1883, p. 269.) On November 3, at the Parkes Museum, a paper was read by S. P. Skipworth, surveyor and inspector of the Caistor Union, on 'The Position of the Sanitary Inspector.' On December 1, at 1 Adam Street, Adelphi, a paper was read by Mr. May, sanitary inspector of Ramsgate, on 'Tenure of Office.' (See *SANITARY RECORD* for December 15, 1883, p. 298.) On January 5, by Mr. T. Buckworth, of St. Saviour's, on 'Housing and Sanitary Inspection of the Dwellings of the Poor.' On February 2, by Mr. F. T. Poulson, of Tottenham, on 'Procedure in Relation to the Abatement of Nuisances.' On March 1, the whole evening was occupied in discussing the many important matters which arose out of those two papers. On April 3, a paper of some considerable length was read by Mr. Thomas Rees, of Guildford Union, on 'The Public Health Act, 1875, from a Rural Inspector's Point of View.'

The whole of the meetings have been well attended,

many inspectors showing their interest by coming long distances in order to attend them. It will be seen that the first two papers and the address of the chairman specially referred to the difficulties and disabilities of the sanitary inspectors; and such was the feeling evinced that something should be done to protect inspectors in carrying out their duties efficiently and fearlessly that it culminated in the following resolutions being unanimously adopted with a view to a memorial being presented to the Government, so that in any alteration which might be made in the sanitary laws provision might be made to strengthen the position of the sanitary inspectors, and provide the same means for superannuation as is provided for officers under the Poor Law administration. Resolutions.—1. That the position of the metropolitan, urban, and rural inspectors be assimilated. 2. That in order that the position of the sanitary inspectors may be strengthened, it is expedient that the appointment of all officers should be approved of by the Government Sanitary Authority, and no officer dismissed by any local authority without final appeal to, and approval of, the said Government Sanitary Authority. It was also resolved to send circulars to all the inspectors in the country, and some 1,944 circulars were sent out, resulting in about 550 being returned agreeing with the intentions of the resolutions, and showing that the association was thoroughly appreciated and supported by the inspectors throughout the United Kingdom. The president has seen the Home Secretary, the Right Hon. Sir W. Harcourt, and arrangements were being made for him to receive a deputation and memorial on the subject; but owing to the earlier adjournment of the Parliament, no opportunity has yet been given for the memorial to be presented. It is, however, hoped that early in the coming session the wishes of the members, and others supporting their action, will be brought before the Government, so that this important matter may be placed on a satisfactory footing.

The important question of the Housing of the Poor, which has excited so much interest in the minds of the public, has also received the attention of the members, and gave rise to a very interesting and important discussion, and the association has been represented before the Royal Commission for the Housing of the Poor by their president and chairman.

The other subjects dealt with in the papers concerned matters of much interest and importance, and the able way in which they have been dealt with by the authors of the several papers, and discussed by the members, fully shows that they are thoroughly alive to the advantages of the meetings and objects of the association.

The winter session was closed with the first annual dinner, which was held at the Holborn Restaurant on June 9, and was honoured by the presence of the president, Edwin Chadwick, C.B., who presided, Earl Fortescue, Baron De Liebhafner, representing the municipality of Paris, Sir Richard Owen, K.C.B., Captain Douglas Galton, C.B., Dr. Richardson, Dr. Carpenter, E. C. Robins, F.S.A., and James Lemon, M.Inst.C.E.

The list of members now comprises thirty-nine metropolitan, sixty-five urban, and forty-one rural inspectors, and three associates, in addition to twenty honorary members. It is hoped that many more inspectors will join the association, as it must be a considerable help to each inspector to have the advantage which such an association presents.

Since the winter session the members have met twice; the first time on July 12, when, through the kindness of Messrs. Doulton, the members present were shown over their beautiful works, and thence, by the liberality of Mr. Johnson, were conducted down the river to view the new process of dealing with offal and refuse at his works at Belvedere, afterwards being entertained at dinner by him at Greenwich. On the next occasion the meeting was held on August 9, at the Health Exhibition, when Professor Corfield met the members, and explained the defects of the unsanitary houses and the benefits of sanitary houses. Several exhibitors were present to explain matters of

interest in the Exhibition, which must have been means of imparting much valuable information to inspectors attending. It is worthy of record that association is the first scientific body that used Exhibition collectively for purposes of edification information useful to them in their daily work.

On Monday, August 11, the president, Edwin Chadwick, Esq., C.B., gave a most important and valuable address to the members on 'The Means to Prevent Cholera.'

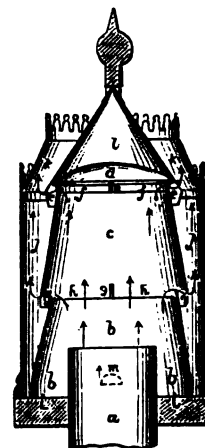
Some idea of the increase of the work of the association may be formed when it is stated that since the commencement 1,116 letters have been sent out, and circulars, and also 1,121 letters have been received being entirely independent of rules, pamphlets papers sent out or received.

The Council have pleasure in stating that the arranging for District Committees to be held in the east and in the west; and it is hoped that as it is important for country members to attend many of the meetings in London, that the arrangement of these District Committees will enable the members in those districts to meet together and read papers and discuss the various subjects brought under their notice. The Council, in presenting the results of the work of the year, cannot but congratulate the members on the decided success which has followed their effort in promoting the work of the association both in the number who have joined, and the prestige status of the society. But they would urge the members not to be satisfied with the present position, but to use each individual will, in some way or other, either by contributing a paper on some matter of common interest by introducing new members, or attending the meetings to help the association to still further progress, so may occupy that position amongst other kindred institutions which such a one as this should, and must attain by urging neighbouring inspectors, not already members of this association, to join it.

ILLUSTRATED SANITARY PATENT

ENGLISH.

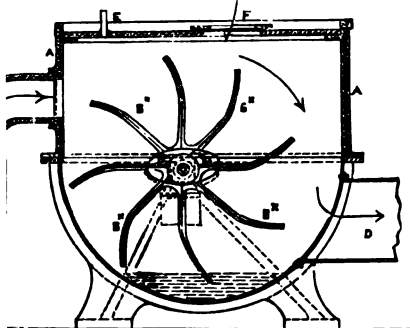
5,270. (1883.) VENTILATION. T. BAUCHOP N.B. [6d.]—This invention relates to a ventilator applicable for the ventilation of halls, churches, dwellings, houses, stables, and buildings generally. The action of the ventilator is as follows, the course of the circulated air passing out therethrough being represented



the arrows shown in the sketch. The ascending column of vitiated air passing off from the building strikes against

side of the plate *d*, and is thereby deflected to annular spaces *f*. The current then passes between the outer surface of the conical cap *i*, inner surface of the taper or conical top *k*, and is allowed to escape. Any of the ascending current of air which does not escape by these means is through the annular opening *h*, formed between *i* and *b*. In the event of a down-blow into the shed between the casing *j* and the enclosed ventilator by means of the conical annulus formed at the end is deflected from side to side between the contained tubes *c* and *b*, until, striking plate or base *l*, it is reflected upwards and through the annular spaces *h*, and outwards through or together with and in the same manner as the current of vitiated air, finally escaping at the *m* which it entered. At the lower part of the casing *j*, as well as at the lower part of the lower *n* more orifices, *m*, are provided for the purpose of the discharge of any rain or water of conden-

(1883.) DEODORISING FOUL AIR. J. F. B. Belvedere, Kent. [6d.]—This invention has at improvements in apparatus for deodorising gas, and is especially applicable for deodorising gas drawn off from drying apparatus used for sea fish or other refuse animal matter. We give



showing the longitudinal section of the apparatus. A is the closed chamber, and B the spindle carrying a paddle (fifty) blades B*; C is the inlet for gas, and D the outlet at one side of the chamber; E is the inlet in the opposite side of the chamber; F is the tap, by which deodorising liquid is fitted to the chamber. A small pipe (not shown) is led off from near the bottom of the chamber by a syphon trap or bend to maintain a uniform level at the bottom of the chamber. F is an inlet at the top of the chamber, covered with a cover. Where it may be desired to drive the wheel at speed, or in which the incoming current of foul air is strong enough to drive the wheel at the speed, it fixes upon the spindle B of the paddle-wheel a driving pulley G, by which the wheel may be driven by the foul air admixed with vapours and gases, drawn off by means of a fan from the drying apparatus (as above stated) first to be cooled by a water, or otherwise to for the most part vapours which are admixed with the air. The air and gas forced forward by the fan is then driven into the chamber A, and to impinge against the blades so as to cause them to revolve rapidly, and against the liquid at the bottom of the chamber with spray, through which the air is driven before it can escape by the outlet D.

(1883.) EXHAUST VENTILATORS. W. WALKER, [6d.]—This invention has for its object a device: so that no matter in which way the wind induced current will be formed, tending to suck

up the air out of the ventilating shaft; and the apparatus consists mainly in providing corrugated surfaces or ducts capable of directing the wind in an oblique direction past

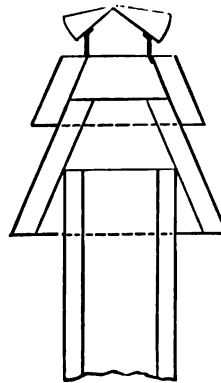


FIG. 1

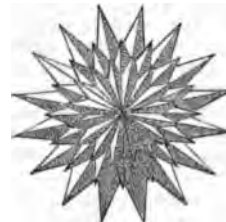


FIG. 2

the orifice. The wind blowing horizontally, or in a slightly upward direction, strikes against the shaft or cones and is deflected upward. It passes up the corrugations into the central vent, and so induces an upward current in the latter. Wind striking against the cap rushes down the corrugations on the opposite side, and past the opening between the cap and the uppermost cone, inducing an outward current from the central vent, while at the same time the cap keeps out the rain or hail that would otherwise fall into the shaft.

5,659. (1883.) SEAL TRAPS FOR WASH-BASINS, &c. A. EDWARDS, Ashbury Park, Monmouth. [6d.]—This invention relates to improvements in that class of traps which are adapted for wash-basins, water-closets, baths, urinals, and like purposes, and where a mercury seal is used to prevent the passage of sewer and other noxious gases or odours through said traps by back pressure, and where such mercury seal is displaced to allow the necessary eduction by hydrostatic pressure. We give a sketch of the simplest form. It having been discovered

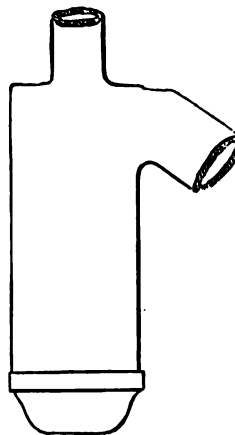


FIG. 1.

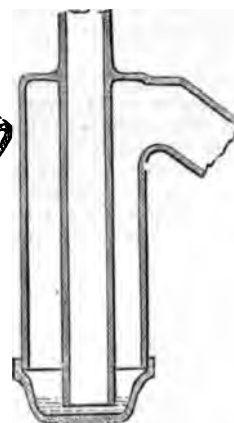
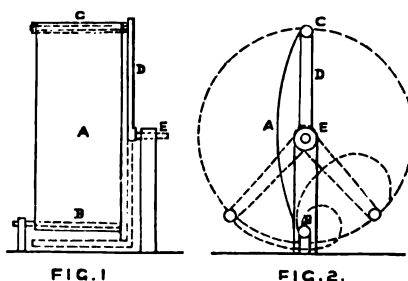


FIG. 2.

that mercury placed in an iron trap has a tendency to oxidise or be changed to oxide of mercury, this chemical is used and located in or automatically supplied to the trap in such a manner that in a short space of time it accumulates on the walls both above and below the seal, forming a coating or film which is poisonous to vegetable life. The larger the area of the inner surfaces of the trap the greater will be the amount of poisonous matter which will accumulate thereon, and the better the protection against disease germs. The gradual absorption of the mercury to

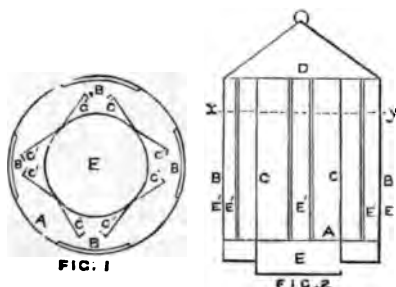
form the oxide necessitates its replenishment possibly every five years, or perhaps oftener when the traps are used in a hot climate. It is essential, therefore, that the traps be constructed in such a manner that the mercury chamber may be easily, and at the same time quickly removed or reached without uncoupling the trap from its connections.

5,786. (1883.) PRODUCING FLUID CURRENTS AVAILABLE FOR VENTILATION. A. LORRAIN, Richmond, Surrey. [6d.]—This invention relates to apparatus for producing fluid currents, such apparatus, when acting on the air, being available for ventilation or blast, or by the reaction of the current produced, for propulsion of the vessel carrying the apparatus. The apparatus may also be applied to produce a current of water or other liquid,



so as to cause a stream thereof, or to effect propulsion by the reaction of the current produced. Fig. 1 is a front view and fig. 2 a side view illustrating one form of the apparatus. A is a sail or web of fabric or other flexible material which may be rectangular as shown, or might be of triangular or trapezoidal shape. One end of the sail A is passed round or linked to a stationary bar B, so that it can freely revolve round the bar. The other end of the sail A is in like manner connected to the crank pin C projecting from the crank arm D, the crank radius being somewhat greater than the distance of the bar B from the centre of the crank-shaft E. On causing the crank to revolve, the sail is made to sweep round with it, expanding to its full length when the crank-pin C is farthest from the bar B, and bellying as the crank-pin approaches, passes under and recedes from the bar B, as indicated by the dotted lines in fig. 2.

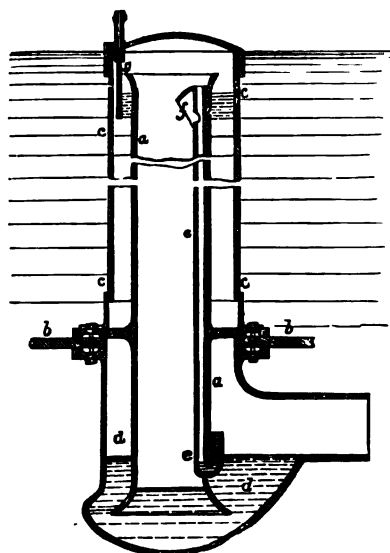
523. (1884.) IMPROVEMENTS IN VENTILATORS. R. POLLOCK & T. H. HERBERTSON, Engineers, London. [4d.]—The object of this invention is to obtain a more efficient ventilation by means of ventilators without mechanical motion, so constructed that rain-water cannot be driven into the extraction shaft, and consists in forming the ventilator with a series of deflectors arranged vertically, one series of deflectors being placed immediately opposite



the openings of the next series. By this arrangement the wind does not directly act on the extraction shaft, so that in whatever way the wind is blowing down draught in the tube will be prevented by the deflectors. In the annexed sketch fig. 2 is a sectional plan of fig. 1, through the line x y. The ventilators may be manufactured of galvanised

sheet-iron, zinc, or other metal, and may be made of convenient shape. Fig. 1 shows ventilator of circular form, consisting of four vertical deflectors in a circle. More deflectors may be used should the shape of the ventilator require it. The outer circle A represents the frame of the ventilator to which the vertical deflectors B are fixed, the series C being fitted opposite the openings of the series B, and being strengthened at the outer edge by stripes of metal C'; the tops of the deflectors being attached to a plate D. E indicates the extracting shaft tube connecting the ventilator with interior of the building. The wind impinging on the deflectors in any direction passing through the openings E', by creating a vacuum in the extraction shaft E, extracts the air from below, and consequently more effectually ventilates the building.

7,148. (1884.) IMPROVED APPARATUS FOR INTERMITTENT FLUSHING FROM TANKS, &c. W. B. OLOMEW, Lambeth, Surrey. [4d.]—This invention improved apparatus for the intermittent delivery of water from flushing tanks and for like uses. As the tank fills, the water rises within the bell as rapidly as on the outer side until the mouth of the vent



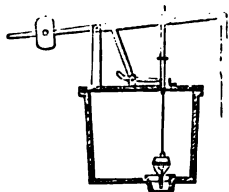
covered by the water, and then no more air is able to escape from the bell or from the pipe a passing within it, for this is sealed at its lower end by dipping the box or water receptacle. The water continues to rise in the tank compresses the air confined within the bell, and this goes on until a sufficient head is obtained to ensure the effectual action of the apparatus, and the water contained in the U bend of the small descending pipe is insufficient to withstand the pressure; this water is then suddenly blown out of the bend, and the compressed air escapes. The air finds vent in this direction, and then beneath the lower end of the large descending pipe a, because the depth of water in the U bend is less than the immersion of the lower end of the pipe a in the water receptacle d into which it dips. As soon as the water escapes from within the bell the water which was already near to the upper end of the pipe a (the vent tube has been so adjusted that this may be the case) rises within the bell and pours in considerable volume down the pipe a. A syphon-like action is at once set up, and the water in the tank or cistern ascends within the bell and pours down the pipe a until the tank or cistern is nearly empty. Air then enters into the bell beneath its lower edge, also by the vent tube, and the action is arrested until the tank or cistern has again filled. During the discharge a small quantity of water enters and is retained within the bell.

e f, and when the action terminates this water to the U bend at the lower end of the pipe e, eed be, closes it, ready for another action, but his bend will be refilled from the lower end during ery of the contents of the tank or cistern by the ke action. The strainer at the top of the recep- tops back solid matters which might choke the the bottom and so render it inoperative.

AMERICAN.

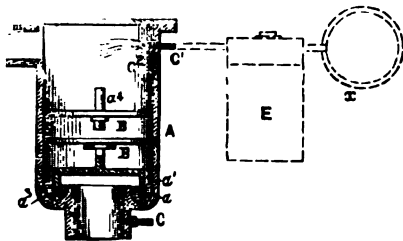
6. WATER-CLOSET CISTERN. WILLIAM SCOTT, Mass., N. Y. Filed Dec. 20, 1882.

—1. In a water-closet cistern, the combination, usual weighted lever and discharging-valve, of a



aft and nut, the combination being such, as l, that when the said lever ascends at its un- end it will operate against said nut, so as to t the discharge-valve through the medium of said aft, and also such that said screw-shaft will then in and descend through the said nut until the e-valve shall be reset.

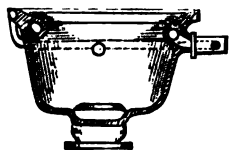
12. SEWER INLET. EDWARD Z. COLLINGS, N. J., and CHARLES F. PIKE, Philadelphia, Pa. g. 10, 1882.



water from a source of constant supply is sprayed trap through removable screens which are above red to the inverted cup-shaped trap valve.

1.—1. The combination of inlet A, trap a, and terminating in a spraying device, c, and leading stant source of water supply, x. 2. The combina- nlet A, having trap a, the pipe c, the spraying l, and reservoir E, substantially as and for the pur- forth. 3. The inlet A, having groove a, inverted cup or valve a', having stem a', and screens or B B.

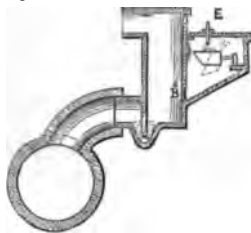
50. BOWL FOR WATER CLOSETS. JOSEPH J. B. New York, N. Y. Issued April 17, 1883.



1.—1. A bowl for water-closets, having a slop le to form an integral portion of it, and constucted shing rims or ducts, also forming integral portions ame combined structure, and arranged to flush or espectively, both the top of the slop safe and the of the bowl.

275,803. SEWER FLUSHING DEVICE, EDWARD Z. COLLINGS, Camden, N. J., and CHARLES F. PIKE, Philadelphia, Pa. Issued April 17, 1883.

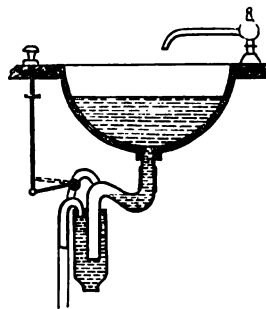
A disinfectant reservoir is located in the path of the pipe, which supplies a constant flow of water into the flushing device, and from there through a grating or nozzle into the sewer trap.



Claim.—1. The combination, with a sewer inlet provided with a flushing device, of a pipe or conduit leading to a constant source of water supply, and a reservoir, adapted to contain a disinfectant, located in the path of said pipe. 2. The combination, in a sewer inlet, of a flushing device, a water supply pipe E, and nozzle or grating B¹.

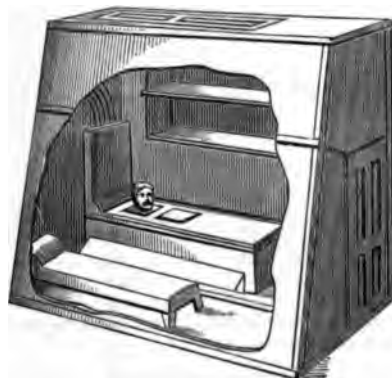
292,055. COMBINED TRAP AND OVERFLOW FOR WASH-BASINS, WATER-CLOSETS, SINKS, &c. CARROLL L. RIKER, Brooklyn. Filed July 18, 1883.

Claim.—1. The combination, substantially as hereinbefore described, with the basin, of the closed vessel situated beneath said basin, the pipe bent to form the trap,



and extending from the bottom of the basin into and near to the bottom of the closed vessel, the discharge-pipe extending from the top of the closed vessel, and turning downward, the connecting-pipe, which extends from the highest point of the trap into the discharge-pipe, and the stop-cock fitted into the connecting-pipe.

294,150. BATHING APPARATUS. JOHN RANSOM, Williamsport, Pa. Filed June 15, 1883.

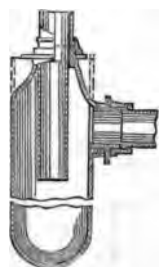


Claim.—A portable cabinet for bathing purposes the bottom of which is composed of one or more shallow pans

adapted to retain water that may be splashed over from the bath tub or tubs.

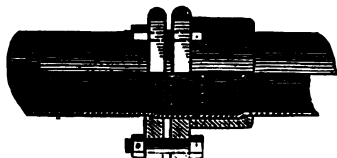
A portable cabinet for bathing purposes, consisting essentially of bottom pans adapted to be nested together, a rear wall secured vertically to the rear edge of the rear pan, end walls secured vertically to the ends of the rear pan, a top secured to said rear and end walls, a hood depending from the front edge of the said top, and having triangular end pieces, end walls, and a front wall secured to the ends and front edge of the front pan, and connected detachably to the end walls of the rear pan and to the hood, and suitable means for ingress and egress, and for ventilation.

294,489. REMOVABLE BOTTLE-TRAP. GEORGE M. McCLOSKEY, Brooklyn, N.Y. Issued March 4, 1884.



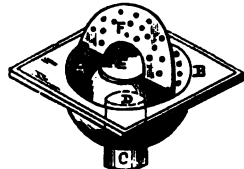
Claim.—In a removable bottle-trap, the combination, with a cylindric cup having its mouth spun into a neck which is provided with a female-screw tube, of the tubular male-screw, having an external circumferential flange, and coupling-ring to receive the inlet-pipe.

294,562. PIPE AND OTHER JOINTS. JAMES A. BALDWIN, Jun., East Jaffrey, N.H. Issued March 4, 1884.



Claim.—1. The packing-ring having a plain surface on one side, and an annular groove in its opposite side. 2. The packing consisting of the ring with a plain surface on one side, and an annular groove in its opposite side, the plain-surfaced side of said ring being inserted into a groove of one part of the joint, and the projecting grooved side of said ring bearing against the face of the opposite part of said joint.

286,951. STENCH-TRAP. RANDOLPH MCBEE, Washington, D. C. Filed May 24, 1883.

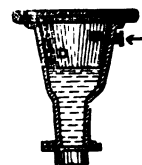


Claim.—A bell-trap comprising a cup, A, drain-pipe, C, and inverted cup or bell D, rigidly supported in place from above by the bridge-plate E, whereby the chamber around the bell and the edges of said bell are left clear and unobstructed, combined with a hinged grated cover which may be opened and closed independently of and without disturbing said bell.

294,758. DISINFECTOR. CHARLES A. CATLIN, Providence, R.I. Issued March 11, 1884.

Claim.—As a new article of manufacture, the disinfecter,

consisting of the solid deodorising-ball D, provided with a length of cord or other suspending means secured to



ball, and adapted to be attached to the lid of a closet.

NEW INVENTIONS.

THE TORBAY PAINT COMPANY'S PATENT STAINS FOR WOOD.

IN the SANITARY RECORD of May 15 attention was called to the fine paints of this company, whose works are at Brixham, Devon, and their London offices at 27 Strand, E.C. The company then drew the attention of the reporter to their stains for wood of a more simple character than those generally in use. Having made an experiment with this stain on a wood-flooring, exposed to a great amount of wear, the writer is now enabled to give a reliable opinion of its merits, and can testify to its excellent qualities. Hitherto the great objection to stains for floors or any woodwork has been the number of operations necessary to obtain the proper result: thus staining, sanding twice, and afterwards varnishing, has been carried out to make a complete work; and when the varnish has been done the varnish often flakes off in patches, and a room in constant use the operation has to be performed again in a comparatively short time. The Torbay Company's stains obviate a great amount of labor and nuisance, and a better and more lasting result is obtained. Presuming the flooring to be dry and one coat of the stain without any sizing effects the stain appears not only to incorporate its color with the wood and dry quickly, but leaves a beautiful appearance, bringing up the grain of the wood and concealing it, and producing a better imitation than the copies of real wood by graining. The stains are supplied in light and dark oak colours, mahogany, &c. For the purpose of restoring the appearance of the stain the firm has produced an admirable floor polish to be occasionally used by the housemaid in her daily duties. The advantages of this stain over painting are manifest; and as the fashion is now fairly set in for square carpets, Indian rugs, &c. the demand must naturally arise for such an efficient preparation. The sanitary advantages of stained floors over nailed carpets are now thoroughly recognised, and therefore need not be further insisted on. Messrs. Stevens & Co., proprietors of the Torbay Paint Company, will supply particulars of their invention if applied to at the works.

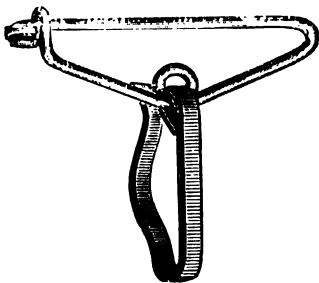
AN APPARATUS FOR REGISTERING THE QUANTITY OF MILK SUPPLIED TO A HOUSEHOLD.

A NOVEL invention for receiving and registering the quantity of milk daily supplied to a family has been patented by a London dairyman, and is being manufactured by Messrs. Bodill, Parker, & Co., of Great Horse Row, Birmingham. In the absence of illustration it is impossible to point out the various features in detail, but a fair idea of the apparatus may be formed from the following description. It consists of a framework on which is fixed on the inside of the door, and communicating with it on the outside is a dial-plate numbered from 1 to 12, with a hand for pointing, and below this an

a pipe, through which the milk is poured and placed inside to receive it. The inner out-plate has a movable plate that passes to and fro, and there is a certain amount of simple connected with it. Each figure on the dial marks, and dots between half-pints, and it is a dial is sufficient to indicate a week's supply. The dial to stand at *nil*, and the domestic being at it at fig. 1, representing a quart, she moves which is actuated by means of a spring, and can be moved in one direction to that figure, and places it on the stand formed to receive it. This stand is provided with a chain and balance weight, which acts upon the plate that moves over the dial. The weight of the jug depresses the stand, the balance weight to rise, and the plate to move so as to open the spout, ready for the milkman to draw the quantity registered on the dial. This operation is performed prior to each delivery, and at the week's supply received is noted, and the dial reset for the following week. The advantages of the invention are absolute security against milk being tampered with after delivery by the milkman in early morning, and to the milk vendor a great saving of cans, which probably has weighed materially with those who take their 'walks abroad' early in the morning with the small milk can at the doors of houses. The matutinal supply, placed there by the milkman before the inmates are stirring, and if they attend to a thought must be fully alive to the counteracted by the milk. This invention is a guard against them, and as a security to the consumer can be safely recommended.

A NEW CURTAIN-HOOK.

DILL, PARKER, & CO., are also the patentees of a new curtain-hook, aptly named 'the Fly,' the hook we presume being the fly of the curtain the 'fly,' the former holding the curtain securely that it cannot escape. The invention has soon caused a revolution in the manner of curtains to cornice-pole rings, and a similar hook appeared for that purpose, so that the old wing each hook required for the suspension of curtains is now practically obsolete. By the use of this device the inconveniences of the ordinary



curtains, if not carefully adjusted, are avoided. The 'Fly' hook cannot become unhooked from the curtain by any cause, or jerked out of its position when the curtains are being drawn. There is in the new invention not a hook at all, but rather a spring loop, which will snap up as soon as it has been passed through the ring of the curtain; when in use the whole of the curtain is thrown on the point of attachment, and there is no tendency to force open the pin and drag the curtain down; this is due to the triangular form in which the hook is made. The hook is capable of bearing a strain of 100 lbs., and its construction is simple. The method of hanging curtains on this plan over others is distinctly obvious.

VENTILATION OF THE 'CASTALIA,' NEW SMALL-POX HOSPITAL SHIP.

THE Metropolitan Asylums Board, having acquired the twin-steamer *Castalia*, have converted it into a small-pox hospital. The arrangement of the pavilions on the upper deck is on rather a novel principle, being in 'echelon.' By this means the greatest amount of light is secured all



round the pavilions, besides furnishing free air-passages for the purposes of ventilation. Accommodation is provided for two hundred patients, being more than can be

accommodated in all the other small-pox hospitals in London put together. Taking a warning from the evil results accruing from the defective ventilation of most hospitals, the Board wisely determined to pay special attention to the ventilation of the *Castalia*, and to assist them in their endeavours they adopted the prudent course of calling in to their aid the highest authorities on the subject that could be secured, Professor de Chaumont, F.R.S., being the principal adviser. After careful consideration and inquiry, it was by the Board decided to adopt Messrs. Robert Boyle & Son's system of ventilation as being the best and most suitable for the purpose; and the Local Government Board having approved of it, and sanctioned its adoption, Messrs. Boyle received instructions to proceed with the work. This is one of the largest and most important ventilating contracts that the firm has yet undertaken; and from the peculiar nature of the application it is also considered to be one of the most unique examples of ventilation in this country, or indeed in the world. For the extraction of the vitiated air there are provided twenty of the self-acting air-pump ventilators, each six feet in diameter, connected with the wards (as shown on the accompanying diagram) by means of iron shafts, measuring from thirty inches to four feet diameter. There are also sixteen air-pump ventilators, three feet diameter, connected with the water-closets, lavatories, bath-rooms, &c., &c. Fresh air is admitted all round the wards by means of openings cut through the walls at the floor level. The air passes in through these openings and over hot-water pipes, which are encased in a false skirting made of iron perforated at the top, to permit of the air being equally and imperceptibly filtered in and diffused throughout the wards. The supply of air is regulated by valves or shutters, worked by means of screws. This arrangement is that of Mr. Adam Miller, engineer to the Board. Great interest was taken by scientific and medical men in the progress of the work, considerable curiosity being excited as to how it would answer. Accordingly on completion experiments were instituted by the Board to test the action and efficiency of the system. The results were of the most satisfactory nature; indeed, quite beyond anything that might have been reasonably expected by even the most sanguine. After an extended series of experiments to test the air-pump ventilators under all states of weather—when there was a good wind blowing, and when there was no wind at all—it was found that the ventilators were extracting at the rate of five million of cubic feet of air per hour, the air in the wards being entirely changed once in every five minutes, whilst there was not the slightest disagreeable draught experienced. During the whole of the tests not the slightest down-draught was found in the ventilators. There were several anemometers used placed in the shafts of the ventilators, readings being taken every two hours; anemometers were also fixed outside to register the velocity of the wind. Messrs. Boyle were not present at any of these tests except the first, they (the tests) being carried out by the engineers and others appointed by the Asylums Board.

Dr. Bridges, Her Majesty's Chief Inspector of Hospitals, after carefully testing the system, expressed his high approval of its action, informing Messrs. Boyle that even when he tested it in a calm he found a considerable up-draught in the shafts, and at no time any down-draught. Sir C. Dilke and other members of the Royal Commission on the Dwellings of the Poor, accompanied by a large and distinguished party of gentlemen, visited the *Castalia* for the purpose of examining its arrangements, and expressed themselves highly satisfied with all they saw. Messrs. Boyle applied their system to the *Castalia* under a guarantee, and it may be taken as good evidence that the Asylums Board was satisfied that all the stipulated requirements had been fulfilled and the system a success, when it is mentioned that their account was paid immediately after the conclusion of the experiments.

The system is also applied to the ambulance and transport steamers *Red Cross*, *Endymion*, and *Albert Victor*.

The value of these experiments to Messrs. Boyle must be very great, as they are really practical tests and prove the real worth of their system and what it is capable of doing. There is only one correct and really reliable way of proving the efficiency of any ventilating arrangement, and that is by the test of actual and extended practical experience. Lecture-room experiments, as all privately conducted experiments can only be called, may be all very well in theory and show certain results, but in actual practice the results are generally found to be very different, as in the case for instance of the *Kew* and other experiments which were supposed by their originators at the time to have entirely settled the question, which were found by no means to accord with the working results carried out on a large scale.

CORRESPONDENCE.

Audi alteram partem.

[All communications must bear the signature of the writer, not necessarily for publication.]

WATER-FILTERS.

At the bidding of the editorial notice in your October number, we reluctantly beg to express our views on the 'International Health Domestic Water-Filters.'

You will admit that the material employed in filters is a point of the greatest importance. Here we object to the use in the 'International' filters of animal charcoal, as it has been proved by all official evidence during the last ten years to *promote* the development of the low forms of organic life. We submit that all evidence we have on the subject points to the probability that the development of those organisms, which are the cause of typhoid, cholera, and similar diseases, will be equally *promoted* by the use of this material in filters.

If any one sends out a *bona fide* challenge, such as you refer to, his first duty is to state a clear case. The statement that 'a patented material, composed of several ingredients' is used in those filters besides charcoal, is clearly a complete bar to criticism such as you invite. That material may be superior to all others hitherto known, or it may be rubbish; no one can express an opinion on something that is unknown to him.

Amongst the points forming the 'challenge' to which you refer there is a remarkable absence of the most important point—viz., the chemical and physiological purification of the filtered water. If the promoters of the 'International Filter' consider this subservient to working, on which so much stress is laid, we repeat what we have before remarked that the easiest way is not to filter water at all.

As regards construction, the sections given in 'challenge' are not sufficiently intelligible. We subsequently took the trouble to send to head-quarters in Adelaide Street, to ask for some illustrated papers. A remarkable reply was received that *they are not yet printed!* It is certainly remarkable that before their papers are printed the promoters of the filter know precisely that its purifying action will last for five years. This, as far as the durability of animal charcoal is concerned, has, as you are aware, been distinctly contradicted by all more recent official and private researches on the subject.

To return to the construction, the section given and that in the 'challenge' are essentially different. There is in the former no 'intervening perforated plate' nor any 'loose medium.' The 'important point' made of the filter being in one solid piece of earthenware is intelligible to us, as we scarcely know of a single filter in which this is not the case. The statement that no artificial joints or connections have to be made in the filter is contradicted in the next sentence, in which it is stated that an earthenware plate is fixed and secured by cement.

one good point in the section in the 'challenge' is provided with two taps. Servants may see them, and should the 'filtered' tap ever pass water the other will always be handy. We scarcely think it prudent that in your 'secrecy' water-tap should be in the same position the unfiltered tap is in the other. Even 'poison' has not prevented fatal mistakes by filters, as may readily happen, some one has a plan of the section side by side with another in the 'challenge,' is the inventor prepared to at servants will always use the right tap?

Objections are these :
 1. Use of animal charcoal for the reasons stated.
 2. Secrecy about the other filtering medium employed renders it impossible to accept the 'challenge' should somebody have nothing better to do.
 3. Mission in the 'challenge' of any reference to an important point—viz., the criterion of the physiological purification effected by the

statement that the filter will remain efficient for more than even the papers describing it have been able to show. We want to know why this has not been extended

to two taps, one for 'filtered,' the other for 'unfiltered,' which must more lead to mistakes, as the filter the unfiltered tap is in the same place as the 'tap in the other.

In deference to the value of your space we shall make up, adding only that we have failed to make a single point in favour of the filter.

Now done, as we hope for ever, with the 'Universal Filter,' which we are told has already been the 'Universal Filter,' we ask your indulgence for an exception to your remark that we (amongst others) consider it sufficient that our filters are under the microscope of the Health Exhibition. We do not by any means attach such weight to this. That test consisted of a simple analysis, and can neither add anything to all the official inquiries during the last ten years, nor to the others. They, one and all, have pronounced the 'Spongy Iron Filter' to be the only water purifier that is secure. The same, as you well know, has been confirmed by practical experience, through our filters in several instances of the greatest

We remain, sir,

THE SPONGY IRON FILTER COMPANY,
 10 Abchurch Lane, London, W.C.
 Oct. 24, 1884.

We have kindly sent me a proof of a letter from the 'Spongy Iron Filter Company' that is to appear in your issue, in which some reflections are cast upon the description of the 'International' Filter that appeared in your October issue, I think it not out of place to make a few remarks upon the letter for the purging myself right with your readers and the before alluded to. With the 'challenge' I have to do; it is simply an advertisement that is inserted in other sanitary journals, and is laid down on an intelligible basis that, I hope, in the interests of the community at large, will be taken up; but the question of the filter is a different matter. Your letter objects to animal charcoal, and seems to imply that I did not state what the other filtering medium consisted of for reasons of my own. I did not say animal charcoal was good, but if the Spongy Iron Filter is ready to accept the challenge, the International Filter, by its own will of course make known what their medium is composed of, and I have no doubt that the letter of the Spongy Iron Filtering Company will lose no time in answering it, for if the filter is good or bad, they are, I believe, to the challenge they have set forth. As to the description of the filter, I maintain that it

is correct; but, unfortunately, an error was made in inserting the illustrations. I understand, on inquiry, that the engravings were not sent to time, and came only when the journal had actually gone to press, and in the hurry they got reversed: viz., the one intended for the notice got placed in the advertisement, and *vice versa*. If the advertisement engraving be placed in the notice, the description of construction is correct. Your correspondent says I contradict myself, for after saying the filter is in one piece, I say, 'An earthenware plate is fixed,' &c. Quite so, but I maintain that this plate has nothing to do with the filter proper, the receptacle for unfiltered and filtered water, perforated plate, &c., being in one solid piece of earthenware; the plate 'cemented' in, to which they take exception, being the extreme bottom and having nothing whatever to do with the filter itself.

THE WRITER OF THE NOTICE OF THE
 'INTERNATIONAL FILTER.'

AWARDS FOR VENTILATORS AT THE HEALTH EXHIBITION.

As we are informed that a select number of ventilators have been tested by the jury on ventilation at the late Health Exhibition, for the purpose of assisting them in adjudicating the awards, we beg to state that we knew nothing of these tests until they were completed, nor was our air-pump ventilator included amongst those tested. It appears that our ventilator was not the only one excluded, as several other exhibitors of ventilators were also not invited to submit their ventilators to the tests. Now it would be interesting to know why so many ventilators, ours amongst the number, were excluded from these tests, seeing that they were all sent to the Exhibition for the purpose of competing for prizes. We are afraid the jury have committed a blunder they will have some difficulty in explaining; for they may depend upon it that the matter will not be allowed to drop until it has been sifted to the bottom. We understand that the method of making the tests was a complete farce, the ventilators being placed inside a tube 8 feet long by 3 feet square, and a blast of air driven on to them by means of a fan; the bottoms of the pipes attached to the ventilators were also inside the tube. It is scarcely credible that such ignorance amongst professed scientific men could exist in this the nineteenth century.

We formally protest against the awards given for ventilators on the ground that our self-acting air-pump ventilator was not tested, and that we were not invited to submit it for the purpose of being tested along with the others, and that, therefore, the awards given do not show that the ventilators receiving them were justly entitled to them.

ROBERT BOYLE & SON.

64 Holborn Viaduct, November 4.

VENTILATION AND VENTILATORS.

The letter from Messrs. Sharp & Co. under the above heading, on page 189 of your October issue, is one of the best I have read for a long time upon the subject, and I should be glad to learn more as to what Mr. Low's scheme for relative testing is.

Testing on the U tube is very good. This is not a new idea, as it was done by Mr. S. S. Hellyer along with other plans, as explained in his work—'The Plumber and Sanitary Houses.' The tests should not be confined to that plan alone, as the double tube system with two anemometers (as done by Mr. Hellyer) is also a good plan. Another plan, which I think would be useful, would be to test the ventilators—either one, two, or more at a time—on separate pipes, and have a large metal or wooden box with two glass panes in it, and a deep self-closing valve, and mark which of the ventilators opened this valve best and kept it longest and widest open.

The ventilators tested should be freely exposed to the wind; or if artificial wind be produced, it should be of sufficient volume to be a good and fair imitation of the

wind, and such 'wind' should have sufficient scope to fairly envelope and freely pass all the ventilators. From want of attention to this, some intended relative testing I lately saw was quite useless in my opinion, so far as giving any real comparative results was concerned.

I quite agree with Messrs. Sharp & Co. in their condemnation of the use of movable cowls for exhaust purposes, as they often stick fast and stand the wrong way. Hence, for permanent use they are not to be commended; and I say so even although I patented in 1877 the Glycerine-jointed Veering Cowl. After a long series of experiments with them I have given them up entirely in favour of the *fixed* exhaust ventilators, and the question to decide is—Which of these is the best?

Mr. S. S. Hellyer in 1880, as the result of the elaborate experiments he had made, stated that Buchan's Induced Current Fixed Ventilator was the best; and as yet I have not seen any substantial evidence to controvert this.—I am, &c., W. P. BUCHAN.

21 Renfrew Street, Glasgow, November 5, 1884.

VENTILATION.

The remarks on pp. 189 and 190 by Mr. W. H. Drake are very interesting, and as the reader peruses them he wonders what the writer is driving at, until just at the close he suddenly discovers that all he has read is merely the prelude to a puff of a particular exhaust ventilator. In short, one is reminded of the farce of a long grace before dinner and a scarcity of meat.

The ventilator which Mr. Drake mentions is not 'really sealed from down-draught.' (There is no wind-acting ventilator in the market which of itself is really entirely free from down-draught; all are liable more or less to such, unless provision be otherwise made to prevent it. It is sheer quackery to state otherwise, and to boast of 'absolute perfection.') When lately tested, as mentioned in a contemporary, it allowed down-draught very badly. Moreover, although patented by the firm he names in 1881, the reversing cap, and almost the exact words descriptive of its use, will be found in a three years' earlier patent of another party. Hence, as it seems to me, it would have been better for Mr. Drake to have acquainted himself more fully with the history and working of this style of ventilator before he wrote as he has done. VERITAS,

THE WATER-TEST.

A short time ago, I was staying at a friend's house in London; not being satisfied with the drains, he applied the water-test among others; the drain was plugged under the area, and water ran into the drain from the back of the house. It was calculated that upwards of 200 gallons were poured in; when the plug was taken out, some three gallons only came away!

Some months since, in the same house, the drains having to be examined, it was found that two lengths of drain-pipe, did not (in one place) meet by a foot!

If, in the face of these facts, people will persist in occupying houses where the drains are buried in the ground many feet below a concrete ground flooring, and without applying this simplest of all tests, viz., the water-test, they will only have themselves to thank for any inconvenience to which they may be put.

November 7.

J. R. T.

THE MEDICAL INSPECTION OF SCHOOLS.

In a letter to the *Times* of October 21 Mr. Balmanno Squire makes the admirable suggestion that at Board Schools there should be 'periodical inspection of the scholars at short intervals by some competent person, and the prompt elimination from the school of infected individuals.'

He goes on to say, 'The machinery for this is ready to hand in the various parochial surgeons, who would doubtless be ready to accept the special office at a special remuneration.'

May I suggest that this inspection should be step further, and that it should be the duty of the inspector, not only to examine the children per se but also in every case of sickness to visit the child and inform himself as to its sanitary state; also children absent on account of illness.

In this way removable insanitary conditions: bad drainage or impure water, would often be brought to notice of which should at once be given to the officer of health for the district.

Merely keeping infected children away from school is of little use without further precaution; but less the children are ill enough to be sent to school it is impossible to prevent their mixing with healthy children come from the least health following up the cases detected at school would valuable help towards discovering the sources of a district.

It would be of great advantage to the public parish doctors were always in direct communication with the medical officer of health; and if both were under the same Board, instead of the medical officer of health being under the Vestry Board, while the medical officer of the sick poor is under the Board of Guardians, thus clashing in carrying out their respective duties, disputes as to who is responsible for a patient suffering from infectious disease, the expense of either case being paid out of the rates—would be avoided.

As things now stand, the medical officer's attention is not directed to the inspection of places where he has notice that some nuisance exists; but if no notice it may happen that infectious disease or some condition dangerous to health continues for a long time without his being aware of the fact, or being in any way to blame for this ignorance.

Parish doctors have probably greater facilities than other persons for learning which are the most dangerous parts of a town or district. If a rule were laid down that they should notify to the medical officer not only of infectious illness, but also those which might be traced to insanitary surroundings, frequently be enabled to prevent a large amount of disease by making a thorough inspection on the first suspicion that something was wrong.

At present the medical officer of health and the parish doctor act entirely independently of each other, and where infectious disease has actually broken out the medical officer has no intimate knowledge of the sanitary condition of the district which every parish doctor must acquire, if the public health is concerned, completely wasted effort, the parish doctor is usually a hard-worked man, with little time to spare for inquiries beyond the sphere of his own immediate duties; so that his duty being limited to prescribing for his patients, he will not feel it his duty to search out the origin of the ailments from which they suffer.

Of course the special remuneration of which Mr. Balmanno Squire speaks would have to be extended to additional work also; but, considering that near epidemic is traced to causes that might with full knowledge have been removed in time to have prevented it, there can be no doubt that more thorough inspection would, in the long run, be a great saving of expense as well as of pain and suffering. E.

October 1884.

A NEW PARK FOR BRIGHTON.—The Presto situate to the north of Brighton, has been formally taken as a public recreation ground. The park covers two acres of ground. It was bought by the Corporation in 1862 from Mr. Benett-Stanford, of Pyt House, who married the heiress to the property, for 50,000*l.* At that time about 10,000*l.* has been spent in laying out the grounds, which are now of an ornamental and a character.

SANITARY JOTTINGS.

SANITARY.

R. PAGET, the Medical Officer of Health for the Kendal Sanitary District, reported at the last meeting of the authority that the water at two new houses, which had been complained of, had been analysed, and found to be pure; and that a close examination revealed that it was used by two dead kittens in the service pipe. At a recent meeting of the American Association for the advancement of science, Professor Atwater read a paper on the 'Chemistry of Fish.' Flounder is the least nutritive of fishes; while the salmon, when fat, is the most nutritive. Oysters have least nutritive matter among invertebrates; and northern oysters are more nutritive than those from the south. The flesh of fish contains less and more water than that of vertebrates. Digestive elements act upon the flesh of fish in the same way as upon that of the vertebrates, about 98 per cent. of the albumoids being digested in both cases. As ordinarily and, fish gives from 5 to 20 per cent. of edible matter. At the Eastbourne Fine Art and Sanitary Exhibition, a special Certificate of Merit (highest award), was granted Mr. W. P. Buchan, of Glasgow, for his ventilating and sanitary exhibits.

WATER SUPPLY.

At Vange, near Pitsea, in Essex, Messrs. Legrand & Atcliff, of London, have just struck chalk at the depth of 4 feet from the surface. Considerable uncertainty existed as to the depth the tertiary formation extended to this part of Essex. No less than 395 feet of London clay had to be penetrated before meeting with the lower tertiary beds, which latter have thus proved to be 129 feet thick.

HOUSING OF THE WORKING CLASSES.

*'How best to help the slender store,
How mend the dwellings of the poor?'*

At the Newcastle Diocesan Conference on the 30th ult., under the presidency of the Bishop of Newcastle, a paper was read by Mr. W. S. Daglish, Tynemouth, on—

THE HOUSING OF THE POOR IN TOWNS.

He spoke as one of the promoters of the Newcastle-upon-Tyne Improved Industrial Dwellings Company. No one, he said, could better testify to the degradation due to overcrowding than the clergy by whom he was surrounded. He pointed out the various agencies which might be brought to bear upon the question—the carrying out of the Artisans' Dwellings Act by corporations or local authorities; the formation by private individuals of model industrial dwellings; the carrying out of the improvement of industrial houses on the systems of Miss Octavia Hill; the extension of the common lodging-house system; the erection of suburban dwellings for workmen with easy access to towns; and lastly, assisted emigration. The formation of model dwellings by private individuals was one of the best means of solving the question, and there was no doubt they could be worked at a profit. Land for this purpose was always expensive, owing to the situation of the dwellings; and the way to meet this would be for corporations to grant land on easy terms, and for the Government to lend money at a lower rate of interest and in longer periods for repayments. To prevent undue competition with private builders, the dividends of the model companies might be restricted. Speaking of common lodging houses, he said that those in Newcastle, considering the class of lodgers and the rate of payment, were reasonably clean and comfortable. Houses in towns were much more convenient for workmen than suburban dwellings. Emigration, he said, ought surely to be the last resource for housing the poor.

Mr. J. Price, manager of the Newcastle Industrial Dwellings, read a paper on the same subject, which will be found *in extenso* at p. 200.

Mr. Albert Grey, M.P., contributed a paper on 'The housing of the poor in the country,' which was read by Canon Creighton. He believed he was well within the mark when he said that between 1841 and the present time nineteen out of every twenty farm cottages in Northumberland had been entirely rebuilt, remodelled, and improved, and the county could compare with any part of the world in the housing of its people. Taking the farm cottages as a whole, it must be said, to the great credit of the landowners of Northumberland, that they were nearly everything that could be desired; and this statement was based on answers to queries addressed to over three hundred representative people in the county. This improvement was going steadily on. The cottages might be divided into cottages on farms, cottages in villages, and cottages near mines. Of farm cottages only few were bad, the large majority were good, and very many were excellent. It had long been his belief that if the parochial clergy would draw up each year a report on the condition of the people in their respective parishes, with special reference to the condition of their houses, important and beneficial results would ensue. Let that report be sent to the rural dean, and considered at the Rural-dean Conference, at which an abstract could be drawn up and forwarded to the Bishop. It would not only give a valuable historical record, but would do much to form a vigorous public opinion, on which they must chiefly rely. He was led to believe that cottages in villages were very bad, and the chief hope for reform lay in the vigorous use of the powers of the sanitary authority, the action of which depended on public opinion. In mining districts there had been great improvement, but still there were many dwellings such as those in Seghill, the only reform for which was demolition. For those cases it was not so much more power that was wanted as a greater determination to use the powers already possessed.

Sir Charles Trevelyan, Wallington, confirmed the view that there had been a great, striking, and progressive improvement in country cottage dwellings. The root of all improvement was to raise the social life of the people. He agreed in the suggestion for an annual report from the clergy.

The Rev. W. E. Houldey, Newcastle, said no real steps had been taken in Newcastle, at any rate, by the municipal authorities to provide for those poor people who had been unhoused by the town's improvements, and overcrowding was intensified by that which was intended to prevent it. Newcastle suffered very much from overcrowding, but was not worse than other large towns. There ought to be practical restrictions as to the number of persons to reside in one room; separate conveniences for each family in tenemented property; an inspecting official independent of the municipal authorities, many of whom were often largely interested persons; blocks of dwellings near works; and habits of temperance and thrift inculcated.

Presiding at a Diocesan Conference at Leicester lately, the Bishop of Peterborough alluded to the question of housing the poor, which he said was closely connected with social purity. How they were to remedy the evil of ill-housing of the poor was one part of the question. The subject (he was glad to say) had occupied the attention of the Legislature, and the State might usefully within certain limits help in the elucidation of the difficulty; but outside these limits State aid would be dangerous. He did not expect much amelioration of the state of the poor from the State's action. If in London the State provided dwellings for the labouring classes, more harm would be done to them than to the rich, because people would crowd to those parts where houses were good; and this fact, with inevitable increase of rates, would lead to lower wages and to a more grinding competition among labourers. It was more the work for the Church than the State. They should make the people discontented with the filth surrounding them, and lead them to improve their dwellings by their own power.

PARKS AND OPEN SPACES.

*The law condemns both man and woman
Who steals the goose from off the common;
But lets the greater felon loose,
Who steals the common from the goose.*

OPEN SPACES IN LONDON.—Mr. H. R. Williams has addressed a long letter to the *Times* pleading for the extension of open spaces in London, and especially for the preservation of the lovely Hampstead Woods, now threatened with destruction. It will not be necessary for us now to endorse Mr. Williams's powerful advocacy of more breathing-places for pent-up Londoners; but there may be convenience in our reproducing the valuable details as to area and the like which he gives as to each of the metropolitan parks now in existence. These particulars are summarised below, certain additional facts being added from a very useful table compiled by Capt. Thompson, Secretary of the Metropolitan Public Garden, Boulevard, and Playground Association:—

EAST AND NORTH LONDON.

Victoria Park (300 acres), purchased with moneys voted by Parliament (£103,000). Under control of Office of Works.

South Hackney Common (30 acres).

Finsbury Park (115 acres). Acquired by the Metropolitan Board of Works for £119,904.

London Fields (27 acres). Acquired by Metropolitan Board of Works and maintained by them.

Hackney Downs (50 acres). Acquired by Metropolitan Board of Works and maintained by them.

Hampstead Heath (240 acres). Under control of Metropolitan Board of Works.

Clapton Common (9½ acres).

Stoke Newington Common (5½ acres).

North Mill Field (29 acres), situated in the 'Marshes.'

South Mill Field (28 acres), situated in the 'Marshes.'

West Ham Park (80 acres). Sold to Corporation of London for 25,000l. by Mr. John Gurney, who contributed 10,000l. towards the cost.

Epping Forest (5,530 acres, including Wanstead Park). Under control of Corporation, who took up the cause of the commoners and stopped the illegal enclosure of the forest. The total cost of acquisition amounted to 257,000l.

WEST END.

St. James's Park (83 acres).

Green Park (71 acres).

Hyde Park (350 acres).

Kensington Gardens (310 acres).

Regent's Park (400 acres).

Wormwood Scrubs (194 acres). Under control of Metropolitan Board of Works.

Ealing Common. Under control of Board of Conservators.

SOUTH-WEST DISTRICT.

Battersea Park (250 acres). Under control of Office of Works.

Clapham Common (220 acres). Under control of Metropolitan Board of Works.

Tooting Common (207 acres). Under control of Metropolitan Board of Works.

Barnes Common (100 acres). Under Board of Conservators.

Wandsworth Common (160 acres). Under Board of Conservators.

[The extra-metropolitan suburbs in this direction are the best off in the matter of open spaces. Although Mr. Williams does not mention it, the county of Surrey was once upon a time practically all common land. Near to London the following commons still remain: Putney Heath and Wimbledon Common, about 1,000 acres; Mitcham and Merton Commons; Kew Gardens (270 acres), Richmond Park (2,255 acres), and Bushey Park (1,100 acres), both of which are Royal parks; Esher, Cobham, Leatherhead, Epsom, and Wisley Commons.]

SOUTH-EASTERN DISTRICT.

Southwark Park (63 acres). Under control of Metropolitan Board of Works. Cost £118,080.

Kennington Park (25 acres). Under control of Office of Works.

Peckham Rye (64 acres). Under control of Metropolitan Board of Works.

Greenwich Park (174 acres). Under control of Office of Works.

Blackheath (267 acres). Under control of Office of Works.

[Besides Plumstead (110 acres), Hayes, and Chislehurst Commons and Bexley Heath, outside the metropolitan area.]

METROPOLITAN PUBLIC GARDEN, BOULEVARD, AND PLAYGROUND ASSOCIATION.—At the last meeting, held at 83 Lancaster Gate, Nov. 4, there was a very large attendance of members. Amongst others present were the Lord Brabazon (chairman), Lord de Vesci, Rev. Harry Jones, Mr. Ernest Hart, and Mr. J. Bedford. The secretary reported much work as having been undertaken and accomplished during the past month. Several letters have been written to the press and public bodies, including protests against illegal building operations upon certain disused burial-grounds. Grants of money were voted for the laying-out as a public garden of the churchyard of St. Bartholomew, Bethnal Green, the opening of the ground surrounding Christ Church, Battersea, the formation of a gymnasium at Stepney, and the further improvement of Canonbury Square. Letters were ordered to be written to the proper authorities concerning a proposed cricket ground in Kensington Gardens, the utilisation of the main drainage embankment, and the planting of trees in Brompton Road. Mr. Bedford reported the opening to the public of the gardens of Blackfriars Bridge, which have been tastefully laid out by the Corporation; and the Rev. W. Dawson announced that the conversion of the disused burial-ground, Benjamin Street, E.C., into a public garden, was to be immediately proceeded with.

EXHIBITIONS.

PARIS EXHIBITION. 1885.

THE International Exhibition of Manufactures and Processes (*Exposition du Travail*) will be opened on July 2, closing on Nov. 21 next year. The Exhibition is under the patronage of the Minister of Commerce, the Minister of Public Instruction and Fine Arts, and the Minister of Public Works. It will be held at the Palais de l'Industrie, Champs Elysées, and is to include a Science Annex and a Fine Art Annex. The London offices are at 1, Castle Street, Finsbury. Communications from British exhibitors should be addressed to Mr. Edmund Johnson, Commissaire Délégué.

VENTILATION OF PUBLIC BUILDINGS.—Messrs. Robert Boyle & Son., 64 Hilborn Viaduct and Bothwell Street, Glasgow, have applied, and are at present applying their system of ventilation and self-acting air-pump ventilators to St. Mary Redcliffe, Bristol, under the direction of Mr. Arthur J. Blomfield, architect, Christ's Hospital; Blue Coat School (second application); Bank of England, Liverpool; Reform Club, Liverpool; Public Hospital, Liverpool; District Hospital, Somerset; Town Hall, Sandwich; Beckett Hospital, Barnsley; National Schools, Stratford-on-Avon; 'Laransstein,' near Arnhem, Holland; Shorncliffe Camp of the Royal Engineers; Lambeth Carlton Club, Brixton; Grand Pump Room, Bath; St. Owen's Parish Hall, Jersey; St. Lawrence Parish Hall, Jersey; Bishop Lightfoot's Institute, Bishop Auckland; Maidenhead Town Hall; Royal Infirmary Naval Schools, Greenwich; Town Hall and Police Court, Dudley; Jewish Working Men's Club, Whitechapel; Devonshire Hospital, Buxton; Bilston Town Hall; Milton Theatre; Llandudno New Board Schools; Post Office, Chesterfield; Union Workhouse, Chesterfield; Inland Revenue Offices, Lincoln; Devon and Exeter Hospital, Exeter; Stroud Union Workhouse; Council Chamber, Keighley; New Police Station, Wandsworth; Council House, Birmingham; Small-pox and Fever Hospital, Birmingham.

INTERNATIONAL HEALTH EXHIBITION, 1884.

ards to Exhibitors in this Exhibition will be published immediately, in a clear and classified form, available for ready reference, in the concluding number of the 'Exhibition Supplement' of THE SANITARY RECORD. This number will also contain an Index to the descriptions of the Exhibits published in the 'Exhibition Supplement.'

NOTICES OF MEETINGS.

SOCIETY OF MEDICAL OFFICERS OF HEALTH,

1 Adam Street, Adelphi, London.

Meeting of the Society will be held on Friday, Nov. 21, at 8 p.m. A paper will be read on 'NOXIOUS TRADES,' by Alfred W. C. S.

PARKES MUSEUM,

74A Margaret Street, Regent Street.

P.M., a Lecture will be given by Dr. Alfred Carpenter on 'CESS AND CO-OPERATION IN SANITARY WORK.'

NATIONAL INSTITUTE OF GREAT BRITAIN.

Examination, held on November 6 and 7, twenty-seven candidates presented themselves—eight as local surveyors and nineteen as inspectors of nuisances. The Institute's certificate of competency to the duties of local surveyors was awarded to Burton R. John Edward Worth, and Gilbert Thomson; and to the duties of inspectors of nuisances to W. Daley, J. Brooks, J. Keal, Thomas Wheat, W. Fraser, John Loach, and F. S. Winsor, J. T. Simpson, Arthur H. Rollinson,

APPOINTMENTS UNDER THE PUBLIC HEALTH ACT.

MEDICAL OFFICERS OF HEALTH.

Henry Hyslop, M.B. Univ. Edin., L.R.C.P. Edin., S. Edin., has been appointed Medical Officer of Health for the Wallsend Urban Sanitary District, at £50 for one year, James Aitchison, L.R.C.P. Edin., L.R.C.S. Edin. (his deceased).

J. M. B. C. M. Univ. Glasg., has been re-appointed Medical Officer of Health for the Rishton Urban Sanitary District, Lanc., at £20 for one year.

Frederick Charles, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Okehampton Sanitary District, at £50 for one year.

Thomas Edgar, M.B. Univ. Lond., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Stamford Sanitary District, at the rate of £20 per annum, to 25, 1885, *vice* Heward, deceased.

Matthew Owen, M.D. Univ. Aberd., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Surbiton Sanitary District, at £50 for one year.

Tholomew Gidley, L.R.C.P. Lond., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Bodmin Sanitary District, at £20 for one year, from Sept. 29, 1884.

Philip William Goulett, L.R.C.P. Lond., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Bournemouth Sanitary District, at £125 for one year.

Edwin Elsworth, L.R.C.P. Edin., and L.M., M.R.C.S. L.S.A. Lond., has been re-appointed Medical Officer of Health for the Thornton Urban Sanitary District, at 25 guineas, per year.

ASSISTANTS, CLERKS TO GUARDIANS, INSPECTORS OF NUISANCES, &c.

William Richard, the Surveyor to the Moss-side Local Board and Urban Sanitary Authority, who was experimentally appointed Inspector of Nuisances, also, upon the death of the late Mr. Richard, has been recommended by the General Purposes Committee, been permanently appointed to both offices, at £275 and £60 per annum.

Mr. John Jacob, F.C.S., has been appointed Public Health Officer for the Borough of Falmouth, at 1 guinea per quarter.

Mr. Thomas, has been elected a Member of the Horncastle Local Board and Urban Sanitary Authority, *vice* Nicholson.

Mr. Samuel, has been re-appointed Inspector of Nuisances for the Hardingsstone Urban Sanitary District, at £26 per annum.

Mr. William Ibbes, has been appointed Surveyor to the Northampton and Urban Sanitary Authority of Northampton, at £100 per annum, *vice* Pidcock.

BRUN, Mr. J. S., has been appointed Surveyor to the Oldbury Local Board and Urban Sanitary Authority, at £100 per annum, *vice* Davis, appointed Consulting Surveyor.

COOKE, Mr. William, has been appointed Inspector of Nuisances for the Longton Urban Sanitary District, at £100 per annum, *vice* Clements, resigned from ill-health.

CROSS, Mr. Ambrose Wootton, has been appointed Surveyor and Water-works Manager to the Loughborough Local Board and Urban Sanitary Authority, at £500 per annum, *vice* Baker, whose appointment has expired.

DEACON, Mr. E. H., has been elected a Member of the Knighton Local Board and Urban Sanitary Authority, *vice* Green.

DENSTONE, Mr. Robert, has been appointed Treasurer to the Sedgfield Guardians and Rural Sanitary Authority, *vice* Simms, resigned.

DICKEN, Mr. John, has been appointed Inspector of Nuisances for the Matlock Urban Sanitary District, *vice* Wright, resigned.

FRAPP, Mr. H. D., has been elected a Member of the Burgess Hill Local Board and Urban Sanitary Authority, *vice* Eurling, resigned on leaving the district.

GOODINSON, Mr. Charles, has been elected a Member of the Rawmarsh Local Board and Urban Sanitary Authority, *vice* Cooper, resigned.

GOODLAD, Mr. Emanuel, has been elected a Member of the Matlock Local Board and Urban Sanitary Authority, *vice* Boden, resigned.

GRIMSHAW, Mr. Richard, has been re-appointed Inspector of Nuisances for the Rishton Urban Sanitary District, at £50 for one year.

GROVER, Mr. Walter, Solicitor, has been appointed Clerk to the Hemel Hempstead Guardians and Rural Sanitary Authority, at £65 per annum as Clerk to the Guardians, and such further remuneration as Clerk to the Rural Sanitary Authority, and to the Assessment and School Attendance Committees, as may be voted annually, and fees as Returning Officer, *vice* Mr. Charles E. Grover (his father), deceased.

HYDE, Mr. Josiah, has been elected a Member of the Wednesfield Local Board and Urban Sanitary Authority, *vice* McConnell, resigned.

JENKINS, Mr. William, has been appointed Inspector of Nuisances for the Wells (Somerset) Urban Sanitary District, at £40 per annum, *vice* Brown, resigned.

JONES, Mr. Thomas Inman, has been appointed Inspector of Nuisances and Surveyor to the Bangor and Beaumaris Rural Sanitary Authority, at £130 and £20 per annum, *vice* Lloyd, resigned.

LAMBERT, Mr. C., has been elected a Member of the Lillington Local Board and Urban Sanitary Authority, *vice* Whitmore, resigned.

LOWER, Mr. Thomas Henry, has been elected a Member of the Newhaven Local Board and Urban Sanitary Authority, *vice* Blackman, resigned.

MALBON, Mr. Henry, has been appointed Rate Collector for Florence and Dresden to the Corporation and Urban Sanitary Authority of Longton, at £60 per annum, and a bonus of £10 if the loss does not exceed 7 per cent., or of £5 if the loss does not exceed 10 per cent.

MATHER, Mr. Samuel, has been re-appointed Inspector of Nuisances for the Surbiton Urban Sanitary District, at £50 for one year.

MELLONS, Mr. Samuel Weatherall, has been appointed Sanitary Inspector, Inspector of Nuisances, and Inspector under the Sale of Food and Drugs Act, for the Parish of St. Luke, Middlesex, at £120 per annum, rising to £150, *vice* Eadgs, resigned.

MELVILLE, Mr. Alexander Samuel Leslie, banker, has been appointed Treasurer to the Gainsborough Local Board and Urban Sanitary Authority, *vice* Tritton, resigned.

OLIVER, Mr. John, has been appointed Inspector of Nuisances for the Bodmin Urban Sanitary District, at £10 per annum for three years, from Sept. 29, 1884, *vice* Jenkins, whose appointment has expired.

PERKINS, The Rev. H. E., has been elected a Member of the Arlecdon and Frizington Local Board and Urban Sanitary Authority, *vice* Harris, deceased.

PITTARD, Mr. Robert White, has been appointed Clerk to the Brentford Guardians and Rural Sanitary Authority, at £200 per annum as Clerk to the Guardians, £60 per annum as Clerk to the Rural Sanitary Authority, £50 per annum as Clerk to the Assessment Committee, £40 per annum as Clerk to the School Attendance Committee, and fees as Returning Officer, *vice* Ruston, deceased.

PRESTON, Mr. Frank Sansome, Solicitor, has been appointed Clerk to the Hinckley Local Board and Urban Sanitary Authority, *vice* Moss.

RIPPON, Mr. William, has been re-appointed Surveyor, Inspector of Nuisances, and Collector to the Consett Local Board and Urban Sanitary Authority, at £130 per annum.

SHELTON, Mr. Charles, has been re-appointed Inspector of Nuisances for the Ripley Urban Sanitary District, at £20 for one year.

SIMPSON, Mr. John, jun., has been re-appointed Inspector of Nuisances for the Wirksworth Urban Sanitary District, Derbyshire, at £30 per annum.

STEWART, Mr. Alan, has been appointed Surveyor and Inspector of Nuisances to the Maldon Rural Sanitary Authority, at £200 per annum, *vice* Brady, resigned.

STRACHAN, Mr. George R., has been appointed Surveyor to the Parish of St. Luke, Chelsea, at £400 per annum, *vice* Stayton.

THOMAS, Mr. Charles, has been appointed Collector to the newly-formed Bexhill Local Board and Urban Sanitary Authority, at 3 per cent. commission.

TUNSTALL, Mr. W., has been elected a Member of the Ilkley Local Board and Urban Sanitary Authority, *vice* Dewhurst, retired.

UNDERHILL, Mr. T. E., has been elected a Member of the Tipton Local Board and Urban Sanitary Authority, *vice* Whitehouse, resigned.

WADSWORTH, Mr. John, has been re-appointed Inspector of Nuisances for the Soyland Urban Sanitary District, at £20 per annum, for three years.

WATERS, Mr. Charles Finden, has been appointed Collector to the Town Council and Urban Sanitary Authority of Guildford, at 45s. per cent. commission, *vice* Copus.

LOCAL INTELLIGENCE.

The salary of Dr. William Sedgwick Saunders, the Medical Officer of Health for the City of London, has been increased from £900 to £1,100 per annum (in addition to £100 per annum as Public Analyst), as from Midsummer last.

The Farnham Local Board and Urban Sanitary Authority have voted one hundred guineas to Mr. R. Mason, the Clerk, for extra services in connection with Local Government Board inquiries, the action at law, &c., in reference to the drainage, and for other matters connected therewith.

Mr. Charles Lineker Betts, whose appointment as Collector of General District Rates to the Melton Mowbray Local Board and Urban Sanitary Authority, we reported in our last, has, unfortunately, been obliged to resign from ill-health.

There were 137 applicants for the appointment of Surveyor to the Corporation and Urban Sanitary Authority of Northampton, at £200 per annum.

The Taunton Town Council and Urban Sanitary Authority have increased the salary of Mr. Jam's Henry Smith, the Surveyor, from £225 to £250 per annum, upon condition of his giving his whole time to the duties.

The Local Government Board have, upon the application of the Urban Sanitary Authority of Exeter, declared the enactment contained in Sect. 90 of The Public Health Act, relating to the making of by-laws as to houses let in lodgings, to be in force within the district.

At a special meeting of the Towcester Parochial Sanitary Committee, held at the Town Hall, a proposal to constitute it a Local Government district was negative; but a resolution was passed requesting the Rural Sanitary Authority to apply for urban powers under Sect. 276 in the contributory place of Towcester.

Mr. Francis Coates, the late Chairman of the Newport Pagnell Guardians and Rural Sanitary Authority, has been presented with a marble clock, modelled after the Colosseum at Rome; a purse containing one hundred guineas, and an illuminated list of subscribers in a gilt frame. The clock bears the following inscription:—Presented, with a purse of gold, to Mr. Francis Coates, by his brother guardians of the Newport Pagnell Union, and other friends, in testimony of their appreciation of his valuable services, during his term of office, for more than thirty years as representative of the parish of Chicheley, as Vice-Chairman of the Board for seventeen years, and Chairman for eight years.—Oct. 22, 1884.

There were upwards of 120 applicants for the office of Surveyor to the Great Grimsby Town Council and Urban Sanitary Authority, at £200 per annum.

The Bourne Improvement Commissioners and Urban Sanitary Authority have, upon the recommendation of a committee, increased the salary of the Surveyor to £350 per annum.

The Rugeley Local Board and Urban Sanitary Authority have increased the salary of Mr. John Henry Freer, the Medical Officer of Health, upon his application, aided by the gentle pressure of the Local Government Board, from £10 to £30 per annum.

The Huyton-with-Roby Local Board and Urban Sanitary Authority, Lancashire, upon re-appointing Dr. E. F. Hall as Medical Officer of Health, have increased the salary from £20 to £30 per annum.

The Chesterfield Rural Sanitary Authority on re-appointing Dr. Angus Mackintosh Medical Officer of Health in April last, reduced his salary from £400 to £350 per annum, which the Local Government Board hesitated to confirm, and urged the authority to reconsider it, which they did: but after discussion, passed a resolution 'that they saw no reason to alter their decision.' (See SANITARY RECORD, June 16, p. 620). The matter remained in abeyance until the authority quite recently inquired of Dr. Mackintosh if he would consent to the reduction; and, at the last meeting, a reply from him was received and read, to the effect that he had no alternative but to do so; whereupon the clerk was directed so to inform the Board above, and request them now to give their sanction.

The Amersham Guardians and Rural Sanitary Authority re-appointed Mr. Hosegood Medical Officer of Health for one year, as reported in p. 192; but at the last meeting they received a letter from the Local Government Board declining to sanction the appointment at present. In the meantime Mr. Hosegood is performing the duties, but as the appointment is not complete until confirmed, he is not legally entitled to the salary. If the Guardians pay it before the Local Government Board have confirmed the appointment they will be surcharged by the auditor. It is true that the Board might, and no doubt would, remit it; but this perpetual conflict is very irritating and troublesome, and ought by some means to be avoided.

There were seventy-six applications for the appointment of Surveyor, Drainage Engineer, Inspector of Nuisances, and Collector to the Wantage Improvement Commissioners and Urban Sanitary Authority at £100 per annum, which were deferred for consideration at a special meeting to be convened for the purpose.

STOURBRIDGE IMPROVEMENT COMMISSIONERS AND URBAN SANITARY AUTHORITY.—At the annual election the following were Members for three years, viz.:—Messrs. W. Griffin, W. Pa J. Cadwallader for the East Ward; Messrs. W. Jones, G. R. and H. Hicklin for the West Ward; Messrs. H. James, J. D. and C. H. Collis for the South Ward.

The Workington Local Board and Urban Sanitary Authority upon the recommendation of the Local Government Board, the salary of Mr. William L. Eaglesfield, as Inspector of Nuisances, from £50 to £100 per annum, his salary as Surveyor at £100.

NOTES AND QUERIES.

Having for some time back been in the receipt of Queries relating strictly to sanitary work, and which it would be easy to without having to refer our correspondent to competent professional advisers, we have opened a column in which to register such Queries and Replies thereto as can fairly be expected from us; and our salaried readers are invited to make such use of this column as will benefit themselves and the community. Both Queries and Replies will, however, be subjected, if unnecessarily long, to a strict censorship.

132. WHAT IS A 'NEW STREET'?

May I ask through your columns for an answer to what at first blush looks suspiciously like a sanitary conundrum—viz. does an 'old street' commence to be a 'new street'? I have sent in plans for a number of houses to be built along what narrow public highway, and we should like to be under the model by-laws if we can? SUB.

[It is not possible to give an answer to this as flipper question; but the matter was fully discussed in Robinson v. Local Board (L.R. 21, Ch. D. 621), and in Portsmouth Corpn. v. Smith (13 L. J., Q. B. D. 184.—ED.)]

133. PUBLIC OR PRIVATE DRAIN.

Who is responsible for a drain in the circumstances stated: authority or the owners? The house-drains of two different meet in a drain constructed jointly by the owners for the taking their sewage into the public sewer, which runs within the premises. (The course of the joint drain in question down the private lane of the owners.) FREEH.

[Sections 4 and 13 of the Public Health Act supply the answer. A 'drain' is defined by Section 4 as a drain used for the disposal of one building only, or premises within the same curtilage (the buildings in question are not). The term 'sewer' includes sewers and drains except those covered by the previous definition. Every sewer is, by Section 13 of the Act, vested in and under the control of the local authority, unless, indeed, it could be argued that the sewer in question was made for the purposes of 'provision' section 1 of section 13.—ED.]

134. SANITARY PROTECTION ASSOCIATION.

1. In what towns are established 'Sanitary Inspection or Protection Associations,' where houses are examined in all details of construction, and a fee is paid for the work?
2. What fee is charged for examining a house, and reporting condition; also for superintending the necessary works, houses rented at 50s., 80s., and 120s. per annum?

[A list of such associations appears in the SANITARY MEDICAL RECORDS DIARY for 1884 (pp. 126 and 127), with all available particulars concerning them. A considerable number appear to be now in successful working, and a further corrected to date, will be given in the forthcoming issue of the DIARY for 1885. The London Sanitary Protection Association, whose address is 1 Adam Street, Adelphi, may be taken as one of these institutions.

[2. The charges are not uniform. The fee for examination is a rule, covered by the subscription payable by members.—ED.]

135. A POINT OF SANITARY LAW.

You will oblige me by giving your opinion under 'Notes and Queries' as to the point of sanitary law raised in the case of 'Mr. Rural Sanitary Authority v. J. Watson,' reported on page 15 of THE SANITARY RECORD for September 15. Also as to the legality of magistrates who are also members of the protection authority.

[We do not see that a second notice was required. I have, however, depend on the form of the summons. The offence should have been framed under Section 95 of the Public Health Act—viz. 'making default in complying with the requisition previous notice.' If this was the charge, no further notice necessary; but, if the charge was for something else, the magistrates may have been right. Section 258 of the Public Health Act empowers justices who are members of a local authority to cases in which such authority is concerned. If, however, have personally been interested in a case, as, for instance, by present at a meeting where the question of instituting proceedings was discussed, they are disqualified from hearing the case.—ED.]

ORIGINAL PAPERS.

OVER-PRESSURE—A COMPARISON.

By MAURICE DAVIS, M.D.

THE friends of knowledge are earnest in their desire to spread education in all directions, but many fear that teaching is being pushed too fiercely; for compulsory education, however excellent, may be purchased at too high a price, as the brain cannot work in a chilled and starving body, any more than seeds can grow in a frozen and wasted soil. Dr. Crichton Browne, in his elaborate and learned report, traces the stationary death-rate from cerebral diseases during the educational period of life (whilst there is a great reduction in all other diseases), to the fatal effect of over-pressure in elementary schools. The Registrar-General seems to bear witness in favour of that view; he says: 'But inasmuch as school work, if it be injurious to health, would probably be so by affecting the brain, and generally the nervous system, it would be well to split up these death-rates from causes other than zymotic, into death-rates from diseases of the nervous system, and death-rates from other causes. When this is done we find that the entire fall was due to diminished mortality from other causes. The rate from these fell from 2.9 to 2.5 per 1,000, whereas the death-rate from nervous affections remained unaffected. Indeed, if a second place of decimals were taken, it would appear that nervous diseases had slightly—very slightly—increased. It would appear, therefore, that while the mortality of children from all causes, and from zymotic causes, has considerably diminished, their mortality from diseases of the nervous system has exceptionally remained stationary. The general improvement has not affected this class of diseases.'

Dr. Crichton Browne then charges the system followed in elementary schools with endangering the lives of 46.1 per cent. of the children placed under the charge of the School Board. He does not however stop here, but speaks bitterly and loudly in the cause of teachers, and pleads: 'We seem to have devised a process admirably calculated for blunting their intellects and whetting their nerves at one and the same time, for making them at once more stupid and more morbid; and it is impossible to contemplate without anxiety what the effects of this process will be if it be not modified without delay. . . . Irritability and feebleness always follow closely in the steps of disorders of the nervous system, and no greater misfortune could befall the country than to have a race of neurotic teachers.' These grave warnings, pronounced in so earnest a tone, suggested as likely to be interesting an inquiry into the relative prevalence of headaches in a school of similar rank, where more time is expended in study and more work done by children younger than those of the general Board Schools. An opportunity for such an inquiry is presented by the Jews' Free School, Bell Lane, Spitalfields, which educates over 3,200 children. This school, which is, we believe, at the present time the largest in the world, was founded in 1817. The house has lately been partially rebuilt at an expense of 20,000*l*. Glazed tiles are freely used; there is an abundant water supply, and the drains are flushed many times a day by attendants engaged for that purpose. The rooms, well lighted and ventilated, are, as well as

the steps and passages, swept twice a day and scrubbed and washed twice a week. This school has never been visited by an epidemic. The working hours are the same as those of the Board Schools, except that work is continued from nine to one, instead of from nine to twelve, in order that there may be time for an additional subject—Hebrew. Ninety per cent. of the pupils are either foreigners, or the children of foreigners, who, brought up to speak the language of their parents, find English altogether strange to them. Yet they have to work in the language of the country without any special instruction in English, which they pick up as well as they can, and in twenty-two weeks they are presented, according to regulations, transformed into British boys and girls, to pass their examination in the First Standard. Work proceeds regularly and steadily, and no spurt is ever put on in anticipation of examinations. On one evening in the week an extra singing class meets for the purpose of training boys to take part in the synagogue choirs. There is also a Sabbath school every Saturday (at which there is an average attendance of 500 children), besides the two hours on Sunday for religious instruction. About 5 per cent. of the children are 'kept in' for a time varying from fifteen to thirty minutes for neglecting 'home lessons,' but never without their dinners. The home lessons are not as well done as they formerly were, but there is little to complain of on this head. The time required for their preparation is estimated to be from half-an-hour to an hour and a half. There is a playground with apparatus for gymnastic exercises, but as it was calculated for 600, and is now used by some 2,000 boys, it is too small for many of the exercises, and as accidents from kicks sometimes arose, it was thought right to remove some of the appliances. From December to March those of the children who are willing to accept it are supplied by a benevolent friend of the institution with a purposely simple breakfast in the shape of a cup of milk and a hunk of dry bread. About a tenth of the boys, chiefly of the lower standards, enjoy this boon; but those in the higher grades, influenced by a feeling of independence, elect to 'suffer and be strong.' The kitchen arrangements and ample space on the girls' side enable the authorities to have the milk boiled, and so offer a warmer welcome in every respect; the invitation is therefore accepted in somewhat larger numbers. Clothing and boots are given to both the boys and girls by a generous family who have long befriended the schools, and we are assured by Mr. Angel, the head-master, that during his long experience of forty-five years, only one instance of abuse has ever been detected. In the immediate neighbourhood of the school penny dinners are offered to the children throughout the year by another institution; 120 children are accustomed to attend, 60 pay the penny, the other 60 have their dinners free: of these 120, 110 are pupils of the free school. These important privileges meet only in a slight degree the pangs of poverty from which the children suffer much. Mr. L. B. Abrahams, the vice-master, informed us that many of the boys employ the intervals in the school-work to exercise some trade for the general wants of the family, that they get very little food during the day, but have to wait until night for the principal meal, which is large or small in proportion to the earnings of the day. In order to prove that no condition of affluence can be claimed for these boys, a show of hands was asked from those who

had come to school without breakfast, when twenty-six boys responded in a class of forty-two in a high standard. As this occurred in the summer months the bounty given during the winter was not available. The regular attendance of other days is somewhat slackened on Fridays and the eve of Jewish holidays, in consequence of the family necessities demanding the services of the children to swell with their earnings the fund required for those days of unproductiveness. Dr. Crichton Browne says: 'In one school visited, the head mistress assured me that to her certain knowledge as many as 8 per cent. of the girls came to school without breakfast in the depth of winter. Cause asked, "Father out of work," "Father in the hospital," "No bread in the house," "Mother lays a-bed." The last of the answers I came to understand was often a childish euphemism for drunkenness or for the morning stupor that follows a night's debauch.' 'The consumption of alcohol which plays such havoc amongst the tender brain-cells and maims so many intellects,' is not amongst the misfortunes of Jews, however much they may be pursued by all the other associates of poverty. The children of the Jews' Free School are younger than those in corresponding standards of other schools. In February 1884, out of 1,826 boys 71 were over 13 years of age, 155 boys were in the Sixth and Seventh Standards. Thus twice as many boys were in these standards as there were boys over 13 in the school. Of the girls, out of 1,170, 32 were over 13, 125 were in the Fifth and Sixth Standards, showing that four times as many girls were found in these standards as there were girls over 13 in the school, that is to say, a fourth of the girls of low ages constituted the high classes. On the boys' side there is a Seventh Standard of 43 boys. Taking, then, the school-going population of England and Wales as 3,000,000 and the Seventh Standard pupils as 5,792, the Seventh Standard pupils of England and Wales are equal to only 1 per cent. of the whole; therefore the Seventh Standard children of the Jews' Free School, being equal to 1.3 per cent., are exactly thirteen times more than those of the general Board Schools of the country. All the teachers on the boys' side, with the exception of the head master, were pupils of the school, and there are only three exceptions on the girls' side. Not one of the candidates from the school for a Government certificate has ever been rejected. The *Jewish Chronicle* states that this school had educated one bachelor of laws, two masters of arts, twenty bachelors of arts, and 100 certificated teachers. One professor at University College claims to have been a pupil of this school, which has trained many well-known preachers and ministers of congregations, as well as teachers and head-masters of other schools. Mr. Mundella, in his speech at the festival of this institution in May, is reported by the *Jewish Chronicle* to have said: 'I find that last year the average percentage of attendance and the number on the register in England and Wales was 73 per cent., the average in the London Board School was 79 per cent., and the average last year in the school at Bell Lane was 89½ per cent., and I understand at the present moment the average daily attendance is 95 per cent. I take the average days in England and Wales and I find them to be 82 per cent., in the London Board Schools 88, and in Bell Lane 98 per cent. The average earnings in the shape of grant last year in England and Wales was 16s. 1½d., in

the London Board Schools 17s. 2½d., and the Jews' Free School 18s. 7½d.; but that applies to the year 1883-4. In 1884 the grant of the Free School was 1s. 10d. per head, the largest ever attained.' Thrift is encouraged amongst the pupils. A savings bank was established nearly thirty years ago. Deposits are paid once a week, and are returnable year with the interest of 10 per cent. per annum, 2½ per cent. being paid by the Moorfields Savings Bank, which the deposits are lodged, and the remainder supplemented by a beneficent friend, whose generosity, equal to his generosity, forbids the publication of his name. Seven hundred and fifty out of 1,826 have been depositors this half year. Interest is not paid on a larger sum than 2,000l. in the year, as the vice-master (the volunteer manager) of the school. The amount involves as much labour as his leisure can accomplish. Moreover, the object is to encourage thrift in the poor, not the hoarding of money by the comparatively well-to-do. Mr. Angel, the head-mistress, conducts a similar system, taking on the girls' side. On approaching the classes we were careful to direct that a pupil suffering from headache from any cause should hold up his hand. In order to test the diligence and good faith of the children, the head-mistress was sometimes put conversely: 'Let him who never suffers from headache hold up his hand.' This was often a slight variation; but the original system was each called out, and separately questioned, with a view to test his grounds for complaint and elicit his opinion of its cause. Thirty per cent. of the pupils are troubled only 'occasionally,' 'during holidays,' 'in summer,' 'from eating,' 'seldom,' 'once a month,' 'before breakfast,' 'bad health,' 'from carrying weights,' still these are included in the list as the children failed to understand the meaning of the word 'habitual.' About 5 per cent. suffer from special days: 'Saturday, when at home as the fire' (it was elicited that the fire was not lit on 'Friday' (being a busy day at home they went away from school); 'running errands,' and 'from carrying weights,' or because boys in the playground were told them about (the hours at school on Friday being from 9 to 2.30, with fifteen minutes' interval in the afternoon); on 'Sunday, from sitting before the fire used for warmth in winter and cooking in the evening. Some had headache two or three times a week daily, the majority suffered most in the winter, many could not assign a cause, but a few were accidentally struck when we had passed the 7th, 6th, 5th, and a portion of the 4th Standards. One boy said he got his headache in the *cheder*. This is a room in which dozens of boys assemble to study the Talmud and other works, and the noise is very great, and the room being hot, crowded, small, and ill-ventilated, the atmosphere is most oppressive. The Jewish authorities had their attention directed to the condition of these *chedarim*, and are making efforts to remove the evils. A large percentage of the who attend the *chedarim*, and of these suffer from headache in the classes examined after the existence of these establishments, 45 per cent. were found to frequent them. Some boys attend from 6 A.M. until school-time, and again in the evening until 10 P.M. Others of tender age spend half-an-hour to three hours in the evening in crowded places. Mr. Angel informed us that boys enter this school with a good knowledge of Hebrew, and an extensive acquaintance

Talmud and kindred works, but perfectly ignorant of secular learning. The groove in which their minds had travelled was so unlike that struck out by western teachers, that it did not necessarily lead to the rapid acquisition of knowledge demanded by the inspectors of the School Board, but that every now and then boys so trained shot with great rapidity far ahead of their fellows. Scarcely a boy would allow that school-work was the cause of the headache. We then proceeded to the girls' side, and questioned those who claimed to have headache in the same manner as we did in the case of the boys. The girls in considerable numbers, unlike the boys, did not hesitate to give as one of the causes—'Lessons;' others charged 'nursing the baby,' 'ear-ache,' 'tooth-ache,' 'summer,' 'late-hours,' 'early-rising,' 'singing-class on Tuesday,' 'hotness of the room at home.'

Amongst these, those who suffered headache rarely, say once or twice a month, attributed to falls and indigestion, amount to about 14 per cent.; exertion at home, rough play, 3; heat of room at home from coke fire, 10; 'lessons,' bad light, reading, bad sight, 14; noise from sewing-machines at home, noise of children in the house, or in the playground on Fridays, 18.

Many could not suggest any cause. When asked that they meant by 'lessons,' whether they considered the daily work of the school had produced their headaches, they replied 'no,' 'the lessons done at home,' either because the light was bad or the room too hot, or the screaming of the children, or noise from sewing machines too great—circumstances under which very few persons would delight to study. This inquiry amongst the girls, and amongst the boys also, tends to show that a large proportion of the headaches in this school is attributable not to head-work performed in school, but to that pursued under most unfavourable circumstances at home. Notwithstanding that the children recognised this position, they all clearly protested against the abolition of the 'home lessons.' Our examination terminated with the Second Standard, because the children in the First Standard are not only very young but unable to understand the questions. In reference to this state of things Mr. Mundella is reported to have said (*Jewish Chronicle*): 'I saw 20 Polish boys of 7 and 8 years of age, whose names could only be ascertained by the assistance of Mr. Abrahams in a variety of languages and dialects. It is marvellous that the Jews' Free School could have accomplished so much with the materials it is supplied with as compared with other schools.' We reproduce Dr. Crichton Browne's table for the purpose of immediate comparison with the results of this inquiry.

Table showing the Number and Percentage of Children in the different standards of Eleven Elementary Schools in London who complained of habitual Headaches.

Standard	BOYS.			GIRLS.			BOYS AND GIRLS.		
	No. of Boys.	Head-aches.	Per cent-age.	No. of Girls.	Head-aches.	Per cent-age.	Boys and Girls.	Head-aches.	Per cent-age.
I.	760	308	40.5	578	267	46.2	1,338	575	43.0
II.	854	337	39.5	773	399	51.6	1,627	736	45.3
III.	707	257	36.4	610	325	53.3	1,317	582	44.2
IV.	607	259	42.7	553	284	51.4	1,160	543	46.8
V.	383	134	35.0	387	217	56.1	770	351	45.6
VI. & VII.	191	82	42.9	177	125	70.6	368	207	56.3
Total	3,502	1,417	40.5	3,078	1,617	52.5	6,580	3,034	46.1

JEW'S FREE SCHOOL.

Standard	BOYS.			GIRLS.			BOYS AND GIRLS.		
	No. of Boys.	Head-aches.	Per cent-age.	No. of Girls.	Head-aches.	Per cent-age.	Boys and Girls.	Head-aches.	Per cent-age.
I.	—	—	—	—	—	—	—	—	—
II.	402	76	18.9	281	128	45.5	683	204	29.8
III.	317	48	15.1	252	115	45.7	569	163	28.6
IV.	234	76	32.4	198	95	47.9	432	171	39.5
V.	170	36	21.1	139	69	49.6	309	105	33.9
VI. & VII.	141	34	24.1	40	15	37.5	181	49	26.2
Total	1,264	270	21.3	916	422	46.0	2,180	692	31.7

Teachers and pupil teachers on the boys' side who, with one exception, have risen from the rank of pupils, are 48: their period of service ranges from 45, 35, 30 years, down to 6 months, making an average of 10.8 years. The time given up to extra daily work and study varies from 7 to 2 hours, the average being 3.5 hours for each of the 48 teachers. Of these—

2 have headaches frequently }
 11 " " rarely } 13
 Quite free from headache 35

Amongst these 4 are university graduates, two of whom are working for a higher degree, 4 are undergraduates working for a degree, 9 are preparing for matriculation, and many others are working for Government certificates. During the last 22 months there have been 27 absentees for 117 days, only 38 of which days could be, directly or indirectly, traced to illness caused by school work. There are 35 teachers and pupil teachers on the girls' side, who, with three exceptions, have been pupils; the period of service varies from 30 years to 8 months; average for each person, 7.9 years. The extra daily work for Government certificates and other purposes ranges from 2 to 5½ hours. In addition to this extra work, many volunteer to teach in the Sabbath schools held in these rooms; all the teachers are provided with seats.

Of the teachers on the girls' side, 6 have headache frequently; 11 have headache rarely—17; quite free from headache, 18; total, 35.

The staff is subject to alterations; some leave to improve their position; the ladies have a double inducement to change, not only to advance in their professional sphere, but in many cases to marry. The instances of teachers leaving from ill-health, or disinclination for the work, are very few. Three left from 25 to 30 years ago in consequence of consumption, from which they died soon afterwards; one was drowned 19 years ago; about the same time another died of typhoid fever; one from erysipelas 14 years ago; one from 'fever'; one left from ill-health, not finding the occupation suitable; and one, this year, from a dislike to teaching. One young lady, after 18 months' experience, abandoned ordinary teaching in consequence of frequently recurring headaches; she exchanged into another department, and now conducts the singing and needlework classes, quite free from her ancient foe. Although there be not the strictest analogy between the two classes, the one being pupil teachers and the other pupil teachers and teachers, there may be some point in comparing the percentage of headaches amongst pupil teachers generally and that presented by the mixed staff of the Jews' Free School. We extract only the total percentages from Dr. Crichton Browne's table,

showing prevalence of headache amongst the pupil teachers.

Percentage.		
Males.	Females.	Persons.
48.8	67.3	64.5
Teaching Staff of Jews' Free School.		
32.6	48.8	40.7

Recognising the delicacy of organisation in girls as the cause of excess of headache to more than double the extent of that suffered by their brothers, it is not so easy to answer the questions why do girls in neighbouring schools endure more than those of the Jews' Free School—and why the boys of this school, with so many special burdens, should yet attain greater results than their colleagues of the Board schools, with half the number of headaches, and that half, including the occasional as well as habitual headaches. No doubt the bread-and-milk given during the four coldest months of the year effect something; the clothing and shoes supplied to each child must also operate favourably, but will these advantages balance the additional daily work involved in learning Hebrew, and in 90 per cent. of the children, English also, combined with the labour and depressing influence of noise and atmosphere at the Cheder? Mr. Mundella is evidently of opinion that they will; for, in his address on Saturday, December 6, he is reported by the *Times* to have said: 'The remarkable circumstances brought about here—for there was no cry of *over-pressure* at the Jews' Free School—were the result of the fact that the Jews of West London took care that their co-religionists at the East did not starve.' The conditions, arranged in juxtaposition, stand thus:—

Special Advantages.

1. Breakfast taken by about 10 per cent. of the pupils during a third of the year.
2. Clothing and boots given to about 90 per cent.
3. Penny dinners received by 9.6 per cent.
4. Avoidance of pressure before examinations.

Special Disadvantages.

1. One additional hour per day for acquiring a knowledge of Hebrew.
2. The necessity of 90 per cent. of the pupils, being foreigners, to learn the language in which instruction is conveyed, and yet to be ready for examination at the regulation time.
3. Work at the Cheder by the boys, at the rate of from 30 to 45 per cent.

Result.

- More Seventh Standard pupils, as 13 to 1.
- Fewer headaches, as 31.7 to 46.1.
- Larger grant by 8.4 per cent.
- Greater average daily attendance, as 95 to 79.
- A higher standard reached at an earlier age.

The majority of these children come from Russia and Russian Poland, where their parents have been subjected to oppression and violence; prohibited from following high-class trades, and abused for adopting those which alone are open to them; treated with contumely for neglecting intellectual pursuits, and robbed and murdered, as we have

recently seen, because their mental superiority casts into shadow that of their neighbour, and because their thrift and industry and temperance enable them to distance him. Does this struggle, instead of blunting and fatiguing with terror their ever-watchful brain, sharpen it into permanent energy and strength, in devising means for evading the fangs of the destroyer? For however hot the pursuit, they still cultivate learning, not always of the hard mother-country, but the long-prized lore of their fathers, who teach 'through knowledge the just shall be delivered'—'A scholar is greater than a prophet'—'You shall revere the teacher even more than your father; the latter brought you into this world; the former indicates the way to the next. But blessed is the son who has learned from his father, he shall revere him both as his father, and his master, and blessed is the father who has instructed his son.' Has this mental striving during centuries created a power to transmit a special cerebral receptivity to the progeny? or is it due to inherited qualities of race? Boudin and others contend for this view, and adduce strong evidence in its favour. Other observers attribute this brain power to certain habits, and dwell with force on the conspicuous characteristic of temperance. Whence comes this temperance? This is a question to be reserved for the decision of ethnologists. If neither of these be the cause, has the School Board a lesson to learn from the Jews' Free School? If headache is to be regarded as the index of endurance, we will take the boys and ask in what way are they relieved from pressure. Boys at both classes of schools have to live and study with almost equally scanty food; they have to learn their home-lessons, and dwell in equally crowded, coke-heated, and otherwise unsanitary rooms. They have cause in all probability equally to complain of strained eyes from deficient light; and are equally harassed by screaming children and noisy sewing machines; each a source of great distress even to those who have few or no home-lessons. The only advantage which the busy boys of the Free School appear to enjoy as against their friends of the Board Schools is, that they are never pressed to prepare for examinations and yet are always ready for them. As a horse allowed to take his own pace will go on almost indefinitely, so a brain not forced beyond its power will accomplish with success all it is called upon to do. Our earnest thanks are due to Mr. Angel, Miss Lipman, Mr. Abrahams, and Miss Rebecca Hart, not only for their most valuable help, but for the alacrity with which they rendered it.

THE Bower-Barff process of rendering iron impervious to rust appears now to be taking that position to which its merits entitle it. It is a well-known fact that new inventions, however good they may appear to experts, have always to undergo a period of probation ere their advantages are fully appreciated, and the Bower-Barff process has but undergone the usual ordeal. Numerous medals have now been awarded the company, including one at the late International Health Exhibition, where it is stated that a considerable amount of public patronage has resulted from the display made. This process is now becoming an important factor in architectural ironwork. It is stated that a firm in Scotland have decided to adopt the process for their water-meter castings, and negotiations are in progress for introducing it into Canada and India; certain firms in the United States, where it has found considerable favour, having also entered into arrangements with the company for working the patent.

SOME RECENT ARTISANS' DWELLINGS.

HOMILY AND A CONTRAST.

By HENRY M. MAVOR.

ONAL inquiry into the requirements of degrees of the artisan classes will lead to various comparisons, which are often over-ly those well-meaning individuals who make business and pleasure to try and alleviate the lower rank and file of the labouring class. The distinction here between the lower and the well-paid artisan will be purposely blurred by this time it is pretty well-known, or at least so, that philanthropy holds but a secondary position when providing many of the huge numbers of dwellings which are being erected in an increasing ratio. A knowledge, either superficial, of the value of land in busy centres diminishes any idea of being satisfied with a return of 2 or 3 per cent. return, and unless the artisan voluntarily forego the profit on an ordinary transaction and substitute sentimentality, the lower rank must remain in their present obscurity, and be as content as they can with the good wishes of those who secure the land then promptly cater for the better-paid artisan who can afford to pay a rent which shall give him in some cases, far exceeding 5 per cent. competitive age only individual philanthropy expected, and isolated charity is powerless to help co-operative misery. That misery may be co-operative is conclusively shown by the unaided efforts of many of the mass to prevent themselves from rising in the scale of comfort and success. Those referred to not only refuse to help themselves (except in a literal sense) or be helped, but with Oriental resignation to the depressing influences of their surroundings, and even consider themselves fortunate to maintain a dead level of squalor and semi-idleness, the outcome of apathy and despair. A point may be instanced in a medium-sized block of dwellings not a hundred miles from London. Some few years ago these buildings were erected in a fairly substantial manner, with reasonableness to the requirements of a class below the middle, viz., those in irregular receipt of wages who rarely exceed one pound per week, and as not to swell the current expenditure; no caretaker appointed to the block, and the tenants were left to look after themselves as best they could. This 'go as you please' principle really a down hill handicap, in which the price paid that in a short time it was found necessary to call in a sanitary inspector to condemn the block as unfit for habitation. Upon representations being made, however, the order was held in abeyance to give the inhabitants a chance to pull themselves out under the able supervision of an energetic caretaker the unruly and malevolent were expelled, and those that remained were made to pay attention to the decencies of life in accordance with the regulations laid down for their improvement, the result being that the block now is in good order. But the large companies paying for the land, and owning a large reserve fund, have nothing to do with this class of tenant, and another class that is under consideration at

One of the most noticeable undertakings of this description is the erection of five large parallel blocks in Petticoat Square, under the direction of Colonel Haywood, the engineer to the Commissioners of Sewers. In some respects, although in a squalid neighbourhood, these buildings are remarkable for the expenditure and general air of superiority, forming a strong contrast with the surrounding quarters. This, however, is a wholesome example, and, as the funds are provided by the Corporation, the scheme is placed on a different footing to those of an ordinary character.

To begin with, the plan is liberal in its space for staircases—i.e. one staircase serves only two tenements of three rooms each on each floor, and immediately opposite the staircase landing is a large scullery or wash-house, provided with ample sink space and a copper, this wash-house being common to the two tenements. There is a sense of elbow-room throughout, which is often found wanting where pounds, shillings, and pence have been the first consideration. The fact of the staircase serving two instead of four tenements (as is often done, without detriment to the general plan) tends to give more seclusion to the occupiers; and, although an expensive feature, it is one that is generally appreciated by the superior class of tenant. In some portions there are shops on the ground floor, with an extensive basement suitable for storage, but not for habitation. The 'fitments' are well arranged and plentiful, the zinc-lined coal-box in the lower half of the living room cupboard being ingenious and useful. The ventilation of the food-cupboard also is a point which could be copied with advantage. The exterior is in places expensively treated with moulded bricks, and the panels and pediments contain some well-designed and executed emblems and the City arms. Fire-proof floors have been used throughout, and the walls and ceilings are finished in hard cement, such as Keene's or Martin's, which is far more expensive than ordinary plaster. The roof, as is often the case, is utilised as a drying and play-ground. One block is finished and ready for occupation, and the remainder are fast approaching completion, and it may be said that these buildings can hold their own against any so far called into existence. The cost of the works will be about 64,000*l.*, and the return upon the outlay must necessarily be very small when compared with a block built for profit. Without going into close calculation the work looks like costing certainly 8*d.* per cubic foot, whereas many large recent blocks have been sufficiently well built for 6*d.*, thus there is a difference of 25 per cent. in the capital outlay.

Another point in the class distinction referred to may be cited in the death-rate as applied to the tenants of the higher rented buildings. It is frequently pointed out that the death-rate is exceptionally low in these cases, but be it remembered that these are *desirable* tenants, a selected class, and selected with commercial discrimination, the able-bodied, well paid, and well fed. The lame, the halt, and the blind find no resting-place, no encouragement here. The individuality of the Samaritan is within circumscribed limits, but happily it is not for all to 'pity and pass on.' Improvidence and drink are factors in the calculation; but it is not so much the fault of the individual as of the age; there is barely room for all to live; to let live is a consideration deferred, and unfortunately too often deferred until the necessity to live at all becomes a doubtful question.

We will now turn to a very opposite case—viz., a block in Cartwright Street, Royal Mint Street, where the East End Dwellings Company are erecting some buildings on a site recently acquired from the Metropolitan Board of Works. The area is about 32,000 feet super, and was purchased for 4,600*l.*, or 2*s.* 10½*d.* per foot. This is a price sufficiently low to give a start on an economical basis. Messrs. Davis and Emanuel are the architects, and the cost is a little under 14,000*l.*, the cost per cubic foot being about 5½*d.* The building is one long rectangular block with a gallery to each floor, at the back running the whole length. It will be seen that an entirely different class of tenant is being here provided for, and the plan and style of building are adapted accordingly, for it is only in the cheaper plans that galleries are now used. It appears that the promoters will be content with a very small return upon their capital; the advantages thus offered to the labouring poor will be great, and worthy of being more extensively followed. The plan is so designed that the rooms can be let off in any number from one to five. The latrines both for men and women are placed on the same landing, and side by side, and this seems to be the least satisfactory point in the scheme. A sink, common to several rooms or tenements, adjoins these latrines, and although this single sink arrangement seems to be a limited accommodation, it will probably suffice for this class of tenant, as the washing will be done in a separate and detached building in the rear. This general wash-house is provided with eight coppers and numerous washing troughs. The general system of sanitation has been most carefully and consistently elaborated and money freely and well spent in this direction. The rain-water from the roof is utilised to add to the flushing of the latrines, which are made of concrete and lined with asphalte, instead of being the ordinary manufactured article. Due provision is made for ventilating the soil-pipes, and trapping and disconnecting the outlets at each floor, and six manhole inspection chambers are provided between the house-drains and the sewer. It is evident that although economy has been the guiding principle throughout, that in order to do the right thing in the right place the necessary expenditure has not been withheld, but the legitimate cutting and saving has taken place where it could safely be done. A somewhat unusual feature is the non-fire-proof construction of the floors; but as a gallery-plan means an ever safe exit in case of fire, a wooden floor of the description used is not of so much importance as it would be in a building planned on a different system. The fittings are of the cheapest kind, the fireplaces are of black Staffordshire bricks, with an iron shelf, so that this latter item is safe from the destructive hands of a tenant who is in temporary (or permanent) want of firewood, for instances are not otherwise wanting of such handily placed material being put to the use suggested. At one end of the block, communicating with the caretaker's residence, there is a club room provided, although the experience hitherto gained goes to prove that a club room is not used or appreciated by the tenants to anything like the extent that it either could or should be. It is very difficult to see why this objection to sociability should exist, but such is the case, and this class is conservative in this respect. The roof here is not utilised as a ground space, probably on account of expense. Progress

is being made with a portion of the interior fittings of some of the rooms, and, as usual, inquiries are already being made by intending tenants.

Taking all the circumstances into consideration it may be safely said that this scheme is a strongly-marked advance in the direction of housing the very poor, a question considered by many (evidently students of human nature) to be without a solution, but the solution bids fair to be within a negotiable distance if experiments of this kind are to be repeated. We have here a cheap site, cheap building, and a *small return*, by which means the tenants can be housed at a rent which does not bear the usual disproportion to their earnings. Theory and practice are ever widely divergent, and never more so than when dealing with questions affecting the many, but here we have the theory of five per cent. accommodating itself in practice to a much lesser amount, and this principle must be the means by which it is to be hoped that the gap between progress and poverty may be reduced. There is here great scope for abnegation; the demand is unlimited; will the supply be forthcoming? will human nature abhor the vacuum? If the 'building society' principle be added to the system here suggested, a still further advance would be made, and one of the great social questions of the day would be in a fair way to be settled, and settled in a way that would go far to remove the prejudice which exists in the mind of the recipient of benefits which are admitted but not readily recognised by those *bénéficiaires* immediately interested. Charity is a cloak which covers a multitude of sins (and sinners), but it will not shelter the independent homeless unless it be a literal cloak and in itself an impenetrable disguise. To render it such may be possible, and a possibility may, by discretion and tact, be brought within the bounds of probability.

MUSEUM OF HYGIENE AT TURIN.—A Museum of Hygiene, similar to the Parkes Museum in London, will shortly be opened at Turin, and extensive purchases in the health department of the International Health Exhibition were made by Dr. Pacchiotti, who is one of the chief promoters of this useful institution. Amongst the principal objects that have been already bought are the two models of temporary hospitals for contagious diseases, by Dr. Villa and Signor Maggi, of Misunto; the portable apparatus for gymnastics for the use of families, of Signor Campazini, of Reggio Emilia; a model of a furnace for cremation by the Milan Society for cremation; three urns to contain the ashes after cremation, of C. Riva, of Milan; and an apparatus for washing and disinfecting automatically urinals, invented by Signor Mottura. The following donations have been made to the museum by the various exhibitors: Signor Buscaglione, of Turin, a model of his oven for disinfecting clothes, &c.; the new Waterworks Company, of Genoa, the model of the great artificial reservoir of the Defarrari-Galliera aqueduct; Signor Bertolotti, the models of houses for the working classes at Bologna; Signor Fassini, of Milan, the plans of the new working men's quarter at Porta Vittoria; Signor Pignocchi, the plans for the water supply to Osimo; the 'Società di Mutuo Soccorso,' of Treviglio, drawings of the co-operative kitchen established in that town; and lastly, the admirably executed collection of wax models of edible and poisonous fungi, comprising no fewer than 288 specimens, made by Cav. Maestri, and given by the King.

At the International Health Exhibition, Gold, Silver, and Bronze Medals have been awarded to the Patent Sanitary and Ventilating Appliances of Mr. W. P. Bechan, of Glasgow,

NEW DEPARTURE IN HOUSE DRAINAGE.

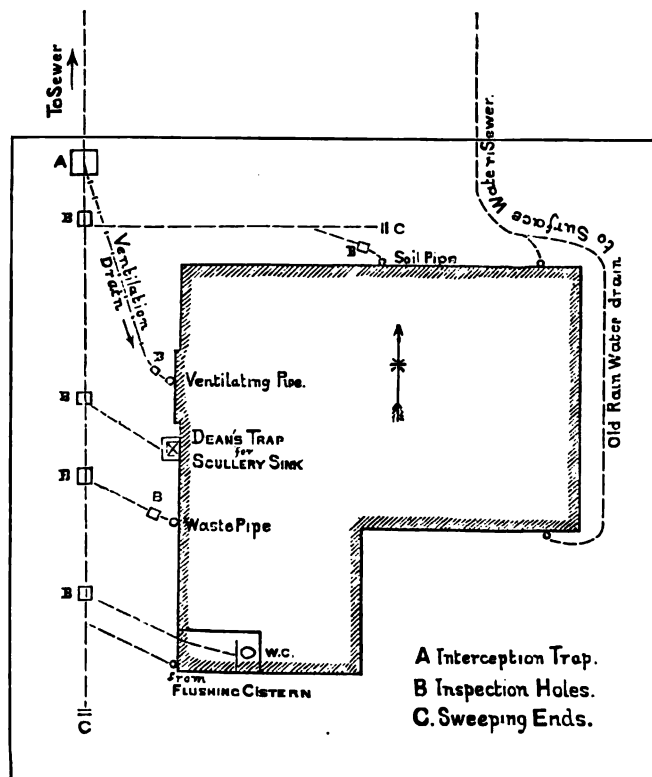
By D. J. EBBETTS.

I had to design the drainage of a detached house in the suburbs of London, in which I proposed to improve if possible upon the ordinary arrangements. Three of the principal such arrangements I understand to be 1. The house-drains should be detached from the public sewer by an air inlet trap. 2. That the highest point of the drains a ventilation-pipe should be taken up to a safe height; and 3, The soil-pipe should be disconnected at foot by an air inlet trap and should be carried up full bore for ventila-

tion; these three points in mind it will be seen that the system acts as it is supposed to do, you have air entering by the inlet traps and passing down the drains and up the ventilation-pipe in the one and up the soil-pipe in the other.

dangerous; as it is often impossible to place such traps at any safe distance from doors, windows, and ventilating gratings. Further, it occurred to me that if I could safely omit the traps at the feet of soil and waste-pipes, I should facilitate the discharge of their contents. The problem, therefore, which I put to myself was how to design an arrangement that should allow the ventilating currents to travel in the same direction as the water in the pipes and drains; that would not require any *open* traps; and, if possible, that would allow of the omission of some at least, of the usual traps.

What I did in my attempt to solve this problem was this: first of all I placed a disconnecting trap on the drain at the point of departure from the premises, and carried up a pipe-shaft from this trap to the surface, and securely covered it over with a stone, &c. From the *upper* part of this shaft I led away a 4-inch branch and connected it with a 4-inch ventilation-pipe. A great deal depending upon this pipe, its position was carefully selected. As the flue from the kitchener is placed in an external wall,



It appears to me to be a very unscientific arrangement, for every time you discharge water in the house into either the soil-pipe or drain, you have a time the ventilating current in each pipe have taken so much pains to establish. Further, the open traps which I have referred to, are constantly charged with fresh sewage, and are the most offensive. That this occurs at the expense of an assumption on my part; it is a fact that I have verified in my practice as well as in that of other town houses, too, with cramped yards, it may be not only offensive but even

advantage was taken of its warmth by fixing the pipe against it. The pipe was carried up to a safe height above the tall chimney stack, and was finished with a fixed extraction cowl.

Having settled the ventilation or extraction-pipe, I looked for suitable air inlets. I found a soil-pipe on the north side of the house receiving the outgoing of a valve w.c. apparatus, and the trapped wastes of a housemaid's sink, and a bath, all on the first floor, and on the west side a rain-water pipe, taking the trapped waste-pipe of a fixed lavatory on the same floor. These two pipes I made the air-inlets of my

new system, and as I determined that no air should pass *up* these pipes, I was able to connect them to the drains with quadrant bends without the necessity of using traps.

Since the work has been finished (more than six months ago) its efficiency has been tested on many occasions during different conditions of the atmosphere, but it has always been found to act admirably, there being on each occasion a steady draught *down* the soil-pipe &c., and *up* the ventilation-pipe, and it was noticed that every discharge of the soil-pipe, instead of retarding the ventilating current, actually and appreciably assisted it, drawing in fresh air at the upper end of the soil-pipe and driving the foul air before it and up the ventilation-pipe.

By reference to the plan it will be seen that inspection holes are provided at the feet of soil, waste, and ventilation-pipes, and also at all junctions; each branch of the drain has a sweeping end, and the main branch is automatically flushed by a Field's cistern. The drains are all 4-inch pipes, laid to a fall of 6 inches in 10 feet, and the interception-trap is a Kenon's (Doulton's) 4-inch trap with a 9-inch body. Should it ever be necessary to sweep any obstruction through the drains, the size of the shaft will permit of its being readily extracted.

What I have done may possibly be no novelty, though it is new to me; but, whether it has been done before or not, it appears to me to be more simple, scientific, and effective than the plan in general use.

MR. P. E. CHAPPUIS, of 69 Fleet Street, has just received from the Lord Chancellor a Royal Warrant, appointing him manufacturer of Daylight Reflectors to the Queen. Mr. Chappuis, who was the inventor of those useful appliances, has during the many years he has been in business proved a benefactor to thousands, who by their assistance have been enabled to follow avocations for hours by daylight that otherwise would have been carried on in gaslight, and to the detriment of health.

SANITARY ASSURANCE ASSOCIATION.—The first of a series of Lectures on Sanitary Subjects was given on Nov. 26 at the Parkes Museum, Margaret Street, W., when Mr. Henry Rutherford, barrister-at-law, lectured on 'Sanitary Assurance from a Householder's Point of View.' Dr. R. Farquharson, M.P., presided. Mr. Rutherford began his lecture with an allusion to the apathetic attitude of a large portion of the public in regard to sanitation. He spoke of the absence of efficient sanitary arrangements in large houses as well as in smaller dwellings, and referred to his own experience as a householder who had sought the advice of the Sanitary Assurance Association, which led to his ascertaining the fact that, instead of the drain from his house going into the main sewer, as he had imagined, it ran in an opposite direction, and discharged itself into his neighbour's garden. And, further, that the drain was not in any way disconnected from the house. In speaking of the Association he said that sanitation had become a science in itself, only to be mastered by special study and actual experience. He did not recommend the compulsory inspection of dwellings: the intrusion into our houses of officials who merely came to see if any evils existed was a form of paternal government which we were not as yet disposed to encourage. At the same time he suggested that every house ought to possess a sanitary certificate, obtained from a properly qualified person, and registered like a vaccination certificate.

MR. BUCHAN has just been informed that his Disconnecting Traps and Ventilators and also the Grease Traps have given the utmost satisfaction since they were introduced at Balmoral Castle.

LIGHT AND AIR IN HOUSE PLANNING.

By G. H. BLAGROVE, A.R.I.B.A.

'WHERE the sun does not enter, the physician does,' says an old proverb; and the value of sunlight as an auxiliary of health is as well understood by the Faculty of Medicine, as is that of pure air. Considerations of aspect in house planning, however, do not appear to be so frequently borne in mind as we might be led to expect. In town houses, indeed, when they are not detached, it is impossible to choose for oneself the situation which a dwelling shall occupy with respect to the points of the compass, since the directions of our streets have already been determined by other considerations than those of aspect. In London, and in other large towns, it unfortunately happens that the directions of the streets are, in the majority of cases, almost due north and south, or due east and west. The best possible conditions of lighting are not obtainable under such arrangements, particularly in the latter case, where the houses face north and south.

A painter or sculptor prefers a north-lighted room for his studio; but, with such exceptions, it cannot, we think, be disputed, that north-lighted rooms are objectionable for habitation during the day. An aspect which admits no ray of sunlight from morning until night, must exercise a depressing influence upon health and spirits. When the choice lies between north and south, we should therefore prefer a south aspect for those rooms which are in constant use, and these, in small houses, are the dining rooms.

Although, in the quaint phraseology of Dr. Fuller, of Sarum, 'a south window in summer is a chimney with a fire in it, and stands in need to be screened by a curtain,' yet the periods of oppressive heat are few and far between in this climate, and the inconvenience of a south aspect is not experienced during the greater portion of the year. A bay, semi-hexagonal upon plan, in which the central window can be completely closed by means of a lifting shutter, is well adapted for a south aspect. Venetian blinds inside a room, although they effectually exclude the light, do not afford much protection against the heat of a midday sun, because the glass of a window offers an extensive surface for the reception of heat, and the transmission of it into the interior of a house. Louvred shutters, hinged or sliding, or Venetian blinds *outside*, are the most serviceable, and the latter, when drawn up, should be entirely protected from the rain by boxings.

In planning small terrace houses, the conditions are, of course, very circumscribed. It is difficult to suggest many improvements upon the ordinary arrangement, in which the house is entered by means of a passage on one side leading to a staircase beyond. The principal room upon the ground floor is in front—the increased width required for the two flights of the staircase reducing the size of the back room to a smaller dimension. A few steps lower, on the way to the basement, we generally find a third, still smaller room, built out beyond the back-frontage line. Over this small room, on the level of the first landing, there is usually a lobby or conservatory, leading to a W.C. and lavatory; but in small houses, the lobby and W.C. are often shut off by a door, and there is, therefore, no staircase window until we reach the landing above the first floor.

We are aware that popular prejudice is in favour of placing the best rooms of a town house towards the street, and that aspect is thus too frequently sacrificed to prospect, because architects and builders are obliged to conform to the predilections of those for whom they cater. If that attention to aspect, which sanitary considerations dictate, more frequently prevailed, we should sometimes see the principal rooms of a small house placed at the back, and the staircase brought to the front, by which some small sacrifices would be counterbalanced by certain advantages, not wholly unworthy of notice.

With the staircase in front, the advantage of a good entrance hall is obtained, with more light and air than in a narrow passage. Beyond the staircase, a narrow passage leads to a lavatory and W.C. in an outbuilding. The small third sitting-room is sacrificed by this means, but the loss is not a serious one. Such a room, built usually with its walls only one brick thick, is much exposed to vicissitudes of temperature, is practically uninhabitable during the winter, and as a matter of fact is used only for boots and lumber. The W.C., formerly on the first landing, where it was too conspicuous, and often offensive, is now in a more retired situation, and a fine staircase window is obtained in the front of the house, on the first landing. The principal drawing-room, extending throughout the whole width of the house, is at the back, and leading off from it, over the outbuilt lavatory and W.C., can be either a conservatory, or a small room, as card or chess room, completing the suite of three drawing-rooms. The outbuilding may, under this arrangement, be carried up to the topmost storey, if desired, since it no longer blocks the staircase, and it can be made available for dressing and bath-rooms, leading off from the bed rooms above. It is usual in planning small terrace-houses to place the entrances on the same side in each house; partly because there is less annoyance from sound when a passage is interposed in every case between the adjoining ground-floor rooms, and partly because there is supposed to be more privacy when the entrances are kept apart. We may, however, venture to point out one or two advantages which would accrue from placing the entrances in juxtaposition.

If the entrances of adjoining houses are brought together, the various parts of their plans will be in reversed order, and in a terrace, the blocks of outbuildings at the back will be coupled together. The result will be that the distance between these blocks will be just double what it would be if each outbuilding stood singly, and that the actual width of the light and air court, above the division walls of the gardens or yards, will be doubled for the benefit of each house—an important consideration. Another result of coupling the blocks of outbuildings would be the substitution of one party wall for two external ones—a measure of economy that ought to commend itself to the approval of all speculators in building.

Some of the small areas upon which inhabited rooms in town dwellings are dependent for light and air, are often productive of conditions prejudicial to health, and the limit prescribed by legislation of 100 feet superficial, is subject to no restriction as to proportion, which is certainly to be regretted, since 10 feet by 10 feet is a very different thing from 20 feet by 5 feet. Besides this, such areas are often carried to heights which render the access of a proper amount of light and air impossible. There is always a tendency, in these areas, for the air to become stagnant, especially in its lower strata. To

remedy this, a device has been employed which we commend to the notice of all who are desirous of securing sufficient ventilation in confined areas. It is exceedingly simple and inexpensive, and it deserves mention from the fact of its being so frequently omitted in the construction of town dwellings. It consists in connecting one open area with another by means of a pipe or channel passing under the floors of the basement rooms. If it pass under a kitchen, so much the better, for the heat of the fire will increase the draught, and promote a free circulation of air.

Rooms in a basement which is sunk far below the level of the ground are never healthy, even when they have wide areas in front of them, which they frequently have not in London. It is to be regretted that some of these rooms, so scantily supplied with pure air as many of them are, should still be permitted to be used as sleeping apartments for domestic servants and others. We are glad to note that in many of our modern suburban residences, the ground floor is raised to a level of about twelve steps above the street footway. By this means, the so-called basement is more than half out of the ground, and the front 'breakfast room' serves for dining. Probably most persons will not mind the trouble of going up a few extra steps to their front door, if by that means their servants can be relieved from passing the greater portion of their existence under ground.

That a basement should be thoroughly ventilated is of the greatest importance, because the tendency is, especially in the cold weather, for the air to rise from thence to the upper portion of a house. It would be better if cellars, or other open spaces, could be contrived beneath the floors of all inhabited rooms. In any case the floors should not be less than eighteen inches above the level of the earth beneath. Floors may be constructed with joists and floor boards, or, on the old Roman plan, with tiles, having hollow spaces beneath for the free circulation of air. Floors formed with wood blocks, laid upon concrete, are now coming into use, but it is to be feared that they are prone to harbour damp, partly from the thickness of the blocks, but chiefly from the absence of ventilation beneath them.

THE Rain-Water Separator, patented by Mr. C. J. Roberts, of Haslemere, Surrey, and which we have had occasion to favourably notice in these columns, obtained a silver medal at the International Health Exhibition, Class XXI. The object of this ingenious contrivance, as stated in our detailed notice previously given, is to separate the dirty water from the clean, and the way in which it is attained is a very successful attempt to overcome a long-standing difficulty. It is, however, *not* a filter, but solely a separator. It is self-acting, and directs into a waste-pipe or foul-water tank the first portion of the rainfall, that washes off, and brings down from the roofs soot and other impurities. After rain has been falling for a certain time, the separator cants and turns the pure water into the storage-tank. We are informed that the apparatus is proving a success in London.

WATER ANALYSIS.—At a meeting of the Council of the Sanitary Assurance Association, at 5 Argyll Place, W., on Monday, December 8, Sir Joseph Fayrer, K.C.S.I., F.R.S., in the chair, it was resolved, on the motion of Mr. Mark H. Judge, A.R.I.B.A., seconded by Dr. George Danford Thomas, 'That, in addition to the analysis of water in connection with the sanitary surveys of the Association, it shall in future undertake to analyse any samples of water forwarded to the Association in accordance with instructions to be obtained of the Secretary.'

DEEP DRAINAGE AND SEWAGE PURIFICATION IN THE BLACK COUNTRY.

(FROM OUR OWN CORRESPONDENT.)

[Second Article.]

IN the first article on this subject (published in the September number of the SANITARY RECORD) we endeavoured to show how, through the passing of the Rivers Pollution Prevention Act, and in other ways, the question had been brought into prominence, and local authorities compelled to take active measures for dealing with the serious and extensive evils arising from the want of drainage at that time generally prevailing in the Black Country district. We also referred to the action taken by the South Staffordshire Mines Drainage Commissioners in respect of surface drainage, and to the physical formation and geological peculiarities of the district. In this article we had purposed detailing what has been done by the midland metropolis, Birmingham, which borders upon that district, in the direction of the collection, treatment, and disposal of the sewage of its 8,500 acres and 420,000 inhabitants. During the interval, necessitated by congressional demands upon space, however, the subject has been so fully and ably dealt with by Mr. Lawson Tait (chairman of the Health Committee of the Birmingham Corporation) in a paper read at the Social Science Congress, and published in the October number of the SANITARY RECORD, that this branch of the subject may very well be disposed of in few words. Years ago, when the houses in the 'hardware village' were less closely packed than they are now, the old-fashioned but still much used midden, combining closet and ashpit, fairly met the requirements of the inhabitants, and the matter collected could be conveyed with little cost to the not far distant agricultural land, where its employment as manure ended the whole matter. As time went on the houses increased and the sites for sewage tips became less numerous and more difficult of access. The pan system was gradually introduced, and the sewage treated in various ways which have developed into a scientific method which brings the resulting nuisance down to as low a point as possible. At the end of last year the number of pans in use in Birmingham was 37,287, and the carrying out of the necessary work involved the collection during the year of 1,847,061 pans and 72,404 loads of ashes; in addition to the emptying of 19,708 privies and ashpits constructed on the old system, and the removal of 56,562 loads of ashes and other refuse therefrom. The stuff thus collected is dealt with by the poudrette process, by which the excreta is dried to a powder, which is very valuable and much sought after for manurial purposes; and on the Sewage Farm at Saltley, where some 220 acres are employed for the purpose of purification by lime and tank precipitation, the sludge being dug into the land, about 240 of the 500 tons of sewage collected in the borough in a week is at present treated by the 'dry' process. The average flow of sewage, storm water, &c., is said to be nearly 14,000,000 gallons per day, and the amount of sludge to each day's sewage is 550 tons, representing about 80 tons of solid matter. Additional land has been secured for the purpose of extending the farm, which has also to deal with the sewage brought on to it from

towns and places outside Birmingham, but within the district and under the control of the Birmingham, Tame, and Rea District Drainage Board, in addition to that from Birmingham proper which at present cannot be dealt with in any other way. So that, on the whole, Birmingham may be said to have manifested a laudable disposition to do its best to overcome the many and serious difficulties by which the question of sewage treatment and disposal is surrounded in respect to a town of its size, population, and situation, and to have not only set an example for other towns to follow, but to have also earned the right to call upon them not to render its efforts towards the purification of the surrounding streams and watercourses nugatory by their own delinquencies and shortcomings.

Wolverhampton, though, like Birmingham, scarcely in the strict sense of the word a Black Country town, or only partly so, covers a large area, and has a large and important population to provide for in sewerage matters. It is by no means so forward in this respect, however, as it should be, considering that it has the interests of something like 80,000 population to look after, with 14,469 inhabited houses, an area of 3,440 acres, and a rateable value of 246,000*l*. The midden system very largely prevails, and some parts of the borough are still unprovided with sewerage of any sort. The first serious attempt to deal with the question was in 1858, when a comprehensive scheme was formulated, and, with several other schemes, formed the subject of consideration for some years. Then the Barnhurst Farm was purchased for the treatment of sewage by broad irrigation, and at subsequent periods portions of the borough were sewered, the total cost to the present time of the existing system being 129,938*l*. In 1883 Mr. Edward Pritchard, C.E., presented a report as to the cost of carrying out a separate system for the unsewered part of the borough, and of additional works required at the sewage farm, the total cost being estimated at 44,100*l*. Nothing was done, however, and in February last a further report was submitted by Mr. G. E. Thoms, C.E., the borough engineer, for sewerage the Rough Hills district, an area of 500 acres, part of which was then drained into the Stow Heath brook; and the cost of draining to the sewage farm that part of the district in question which drained into the brook, was estimated at 2,150*l*. Subsequent to that a report was furnished by Mr. Pritchard dealing with practically the same area, in which report the cost was increased to 3,600*l*. As part of the Rough Hills district could not be drained to Barnhurst, the borough engineer suggested the obtaining another site for sewage treatment for that part of the borough, and recommended Highgate Common, situate a distance of nine miles. Matters went on in this way until the Corporation were served with notice of legal proceedings under the Rivers Pollution Prevention Act, by Messrs. Elwell, of Wednesbury, and also by the Bilston Commissioners, for polluting the Stow Heath brook, a tributary of the River Tame. The pollution was practically admitted, but the Corporation appealed for a suspension of the provisions of the Act affecting the case during a reasonable period, to allow of a scheme being formulated which might meet the wishes of the complainants. Mr. J. T. Harrison was sent down by the Local Government Board as a Commissioner to enquire into the circumstances, and he was informed that a sewerage scheme for the locality in

question, providing for the sewage being sent in the main sewers to Barnhurst, had been prepared, that plans for carrying it out were in course of preparation and were expected to be ready for submission to the Local Government Board within six months, for which period it was desired the Act might be suspended as affecting Wolverhampton. The inspector generally approved of the scheme, which is that prepared by the borough engineer, and the time asked for was granted. This scheme is part of a larger scheme prepared by Mr. Thoms, providing for drainage to and additional works at Barnhurst, the sewerage of Rough Hills, Merridale, and Newbridge districts, and intercepting and outfall sewers for the part of the district proposed to be treated at Highgate Common, at a total cost of 63,400*l.*, which, added to the amount already expended, brings the total sum for sewerage works in connection with the borough of Wolverhampton to 93,338*l.* The work seems to have been done in a piecemeal fashion, and has, doubtless, cost more than one bold comprehensive scheme would have done. It may be necessary to recur to Wolverhampton in another paper. But for the present it can well be left, with the general observation that it does not appear to have added very much either to the general or scientific knowledge of sewerage disposition and treatment, and that it is still behind many other towns of lesser importance in the manner in which it has dealt, and is dealing, with this important question.

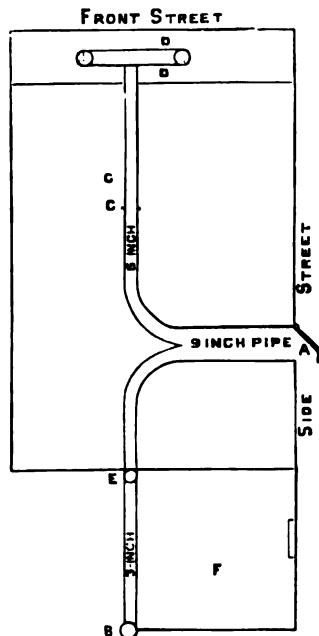
Willenhall, a town of some 18,500 inhabitants, situate in the Black Country, near to Wolverhampton, under the jurisdiction of a Local Board of Health, and containing an area of 2,168 acres, has also been in great trouble in reference to its pollution of the river Tame, and in January last, in order to avert costly legal proceedings which were threatened by the Birmingham Corporation, by the National Arms and Ammunition Company, of the same town, and by Messrs. Elwell, of Wednesbury, who have a vested interest in some water-course, known as Elwell's Pool, which is fed by the Tame, it was found necessary to take some decisive steps in the matter, and it was agreed that pressure be brought to bear upon the owners of some land required for irrigation purposes—this being the system of treatment proposed to be adopted. One main sewer through the town, it was considered, would be sufficient, and some demur was made to any scheme being carried out which would cost anything like fifteen to twenty thousand pounds until every means had been tried for doing what was required at a less cost. Eventually Mr. Baker, the surveyor, was appointed engineer to the scheme, with instructions to prepare the necessary plans, surveys, and specifications for carrying out the work.

The Corporation of Walsall was one of the first public bodies in the Black Country district to recognise the gravity of their position as an unsewered town in regard to the pollution of streams and watercourses. And they have carried out a system of sewage purification by broad irrigation and intermittent filtration, at a cost of about 53,000*l.*, in a complete and satisfactory manner, so far as Walsall proper is concerned, while other towns have been thinking about what they should do. And it is now seeking the sanction of the Local Government Board to a further expenditure of about 27,000*l.* for completing the scheme in the area within the jurisdiction of the Corporation by the sewerage of the

adjoining district of Bloxwich. The history of the proceedings which culminated in the completion of the Walsall Sewerage Scheme is of some little interest, and affects similar works now being or about to be carried on in three or four neighbouring towns. But it is too lengthy to enter upon here, and must be reserved for another article.

A HISTORY OF A HOUSE-DRAIN.

THREE sinks and a wash-hand basin in different floors of the house communicated with the drains, two sinks being protected by bell-traps, with the bell generally absent, and the other two by syphon bends in the pipes. The waste-pipes of three cisterns entered the drains, whether trapped or not trapped is not known. The water company, philanthropists without any intention of being so, demanded some years ago a disconnection altogether of these pipes with the drains. This wholesome change suggested the separation of the sinks from the drains, and the substitution of syphons for bell-traps in the areas. After all this had been completed, the house was considered to be in a first-rate sanitary condition, and the tenant felt very secure, as, on purchasing the lease of the premises some twenty years before, he had the old brick drains removed and glazed pipes put in their places by a builder who was considered an excellent workman.



About two years ago rats were found in the house, but, as the sewer in the side street had been recently opened, it was believed that some of these beasts had escaped from the sewer and changed their lodgings in favour of a little room F, opening into this street. Many were caught, but more came on, committing serious depredations in the pantry and flooring, literally—

'And down through the ceiling, and up through the floor, From the right and the left, from behind and before.'

At last a builder was sent for. He did a deal of digging and bricklaying and slaughtering of rats

while the family were away, but all to no purpose. Then a more knowing man in the specialty of drains was employed. He unearthed the whole system, and found the valve-trap A was held open by a piece of wood that had floated down the sewer, so that the rats had free access to the drains, from which they reached the roof of the small building in the garden through the rain water-pipe B, which was directly continuous with the drain. Having reached the roof, as they were seen to do by a neighbour, they spread themselves as they listed over the ground floor and basement.

On examining the drains it was found that two joints, CC, had never been cemented, that some small pipes near the front sink were crushed, and that the inclination of the whole drain was in a backward direction. All these defects have been corrected, a syphon-trap and a ventilator interposed between the sewer and main drain of the house, a tall pipe extending beyond the roof inserted at the termination of the drain, and the short water-pipe E made to deliver its rain water on the open. After capturing a few remaining rats they were seen no more; and now it is to be hoped the occupiers of the house are not only *secure* but also *safe*.

THE TORQUAY WATER SUPPLY.—It has been very properly laid down, as a principle upon which sanitary authorities should act, that no effort should be wanting on their part to ensure an ample supply of water from a source beyond suspicion and free from the possibility of contamination. This, we learn from the *Western Morning News*, is exactly what has been done by the Torquay Local Board, the water supply for that place and the surrounding towns being obtained from the natural watershed of Dartmoor, about eighteen miles distant. The completion of the second storage reservoir, at Totitford, after encountering serious difficulties, is a matter for congratulation. Should no further mishap occur, and the rainfall be abundant during the next few weeks, the new reservoir will soon be full. It has a holding capacity of 200,000,000 gallons, in addition to the 100,000,000 gallons contained in the old reservoir, situate below it in the same valley. The two reservoirs are, therefore, capable of storing an aggregate of 300,000,000 gallons. They are constructed at an altitude of 700 feet above the sea level, and the water is conveyed thence by gravitation through a series of perfectly-closed mains and distributed into every part of Torquay, as well as to Newton Abbot, St. Mary Church, and Cockington, to a population of upwards of 40,000. So abundant is the water that a constant supply is given, and assuming 25 gallons per head as a sufficient daily supply, the reservoirs are capable of impounding ten months' supply for the whole district, so that any future period of drought will be able to be met without the least anxiety. The total cost of the new reservoir has been about £31,000, being several thousand pounds over the original estimate owing to the leakage discovered in the dam and its rectification; and altogether, since 1858, the authorities of Torquay have spent £120,000 in providing a pure and abundant water supply. The softness and purity of the water is shown by the fact that the total solid constituents amount to only 4.56 grains per gallon, and that it is perfectly free from organic and mineral impurities of every kind. The value and importance of these figures will be better understood by a slight comparison. The water of the Lake of Geneva contains 10.64 grains of solid constituents per gallon; the water supplied to some parts of London 21.66 grains; and the water supplied to New York, which is regarded by American chemists as possessing remarkable purity, contains 5.73 grains per gallon.

THE SANITARY RECORD.

DECEMBER 15, 1884.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

Local Authorities throughout the country would confer a favour on the EDITOR of the SANITARY RECORD if they would forward to him all published documents relative to Water-supply, Sanitation, and Health matters generally, which come under their notice. He would also be glad to receive reports from Engineers of Waterworks, Sewerage Projects and Domestic Drainage Improvements for notice, comment and illustration.

A WORD AS TO RESERVOIRS.

THE notices of intended applications to Parliament in the *London Gazette* are not as a rule very attractive reading, except to those who are interested in observing how hope springs eternal in the promoter's breast. There seem to be this year, however, an unusually large number of applications with regard to water-supply. Nine corporations and eighteen companies are asking for powers to extend their districts, to establish new works, and especially to construct new reservoirs, the descriptions of which the framers of the notices appear to pen with a certainunction. Now looking to the water famines which several of our great towns have narrowly escaped of late, and from the danger of which some of them do not appear even now to be free, the importance of a largely increased storage of water for the wants of large urban communities can hardly be overrated. But there are dangers in these huge reservoirs of millions of gallons of water, as the bursting of several of them in days gone by has amply shown us; and we confess to a certain feeling of apprehension as to the rapid multiplication of these colossal water receptacles without adequate supervision or inspection. It may be argued that the interests of the corporation or company erecting the reservoir will be all on the side of making it as safe as possible, as its bursting would mean ruinous expense to them. But this notion of what constitutes safety may not always fit in with that of the public at large; and, in the event of a catastrophe, the latter would be infinitely the greater sufferer.

It may be worth while, therefore, to ask with what precautions the Legislature has hedged the security of reservoirs. The record of these precautions must be something akin to the historic chapter on 'Snakes in Iceland': there are none. It is true that under sections 5 to 11 of the Waterworks Clauses Act, 1863, anyone frightened at the danger of a reservoir may complain to two justices, who are to make inquiry into the truth of

the complaint. If it is found to be valid, and the danger is so imminent as not to admit of delay, the justices may order such person as they think fit to enter on the property of the undertakers and to do what is necessary. Or they may order the undertakers to take the necessary precautions, and in default get the work done themselves. This is all very well in theory, but is of no use in practice. What is wanted is some sort of guarantee that a reservoir shall be properly and substantially constructed in the first instance, and that it shall be kept in proper repair during its use. And to secure this there is no more workable or efficient plan available than inquiry and inspection by a Government or county official independent of the undertaking.

Some day, when a great catastrophe has happened through the bursting of one of those colossal reservoirs that have recently excited Mr. Ruskin's wrath, and that certainly do not add to the picturesqueness of landscapes whatever they may do to the comfort of townspeople; we shall have a fine clamour set up throughout the country, and a demand for a general inquiry or select committee into the subject. The diligent student may usually find by a little research in the attractive region of blue-books, that a Select Committee or Royal Commission has in days gone by made an exhaustive investigation into any given subject that may be named, and has issued, to quote a recent and sportive commentator, 'an elaborate report which nobody reads, full of the most excellent recommendations that are never carried out.' Of such is the question of reservoirs.

Well nigh twenty years ago a Select Committee, shocked at the inundations at Holmfirth, took evidence as to the security of reservoirs, and reported their opinion that in all cases in which it was proposed to construct a large reservoir, the undertakers should submit to the proper Government department plans and sections of the site, and of the works to be erected, and also descriptions of the mode of construction; that a competent person should in all cases be sent to the site to verify such plans, and to inspect and report on the works that were to be constructed, so that if there were any glaring deviation from the rules laid down by any private or general Act respecting waterworks, the deviation might be made known to the central authority. The Select Committee further recommended that when any reservoir was completed, the undertakers should be bound to give due notice of such completion, and that such reservoir should not be filled with water until after the expiration of a specified time. They suggested moreover that an adequate supervision over all large reservoirs should be maintained by the central authority; and to that end, from time to time, competent persons should be sent to inspect and report upon such reservoirs. Sound recommendations these; but they have met the fate of many others as good in having been persistently ignored for twenty years.

DR. SWEET, medical officer of the Hebburn-on-Tyne Local Board, reported at their last monthly meeting that the births in the district during the month of November show an average of 42.9 in the thousand, whilst the death-rate during the same period was only at the average of 12.5 per thousand per annum. These returns are not less satisfactory than remarkable, considering the great distress that exists in the district from want of employment.

PAYMENT BY PATIENTS IN HOSPITALS PROVIDED BY LOCAL AUTHORITIES.

THE Public Health Act, 1875, by sect. 131, enables local authorities to provide, for the use of the inhabitants of their districts, hospitals or temporary places for the reception of the sick; and for that purpose to themselves build such hospitals or contract for the use of any hospital already existing. The expenses of maintaining in such hospital a patient who is not a pauper are, by sect. 132, to be deemed to be a debt from the patient to the local authority. There is no general power to compel patients to go into hospitals; but where there is a hospital in or near the district of a local authority (whether provided by that authority or not), any person who is suffering from a *dangerous infectious disorder, and is without proper lodging or accommodation, &c.*, may, on the certificate of a legally qualified medical practitioner by order of a justice, be removed to such hospital at the cost of the local authority (sect. 127). [The question of the fitness of the lodging or accommodation of the patient must be decided with reference to the possibility of keeping other persons free from infection, as well as to the suitability of the lodging for the treatment of the patient.] If he is properly removed to a hospital provided by a local authority, such authority have the same power of recovering the cost of his maintenance there as if he had voluntarily become a patient; but, unless care is taken, they may find themselves unable to enforce their charge.

The cost of maintaining an individual patient in a hospital is not generally very great, and, consequently, where the payment is disputed, such cases are not likely to be brought into the superior courts. There have, however, been some cases in county courts which exemplify the difficulties with which local authorities have to contend. In the year 1881, Sir R. Harrington decided in the Warwick County Court that, though the expenses of maintenance in a hospital were recoverable from the patient, they were not recoverable from the person bound by law to maintain the patient (unless, of course, he has agreed to pay them), and consequently, that a father could not be made liable for the maintenance of his infant child in a hospital provided by a local authority. The SANITARY RECORD for November also contains a notice of a similar decision in the Salford County Court. A case decided on Nov. 4 last by Mr. Metcalfe, Q.C., at Bristol, goes still further. In that case the patient, a child, was admitted to the Bristol Royal Infirmary, and, when there, was discovered to be suffering from typhus fever. The Royal Infirmary, apparently, is not intended for the treatment of infectious cases, for the medical officer tried to send the child to the fever hospital. That, however, was closed temporarily, in anticipation of an outbreak of cholera, and the child could not be admitted. Finally she was taken into the infectious ward of the Stapleton Workhouse Infirmary, and was there treated successfully, and after five weeks discharged cured. The guardians of the Stapleton Union tried to recover the cost of her maintenance during the above period, but her father resisted payment on the ground that he had not consented to his child being removed to the workhouse infirmary, and would have preferred to have her nursed at home. He had other children at home, who would have been exposed to the infection, and it was evident that the case was a most proper one to be treated, as it

was, in an infirmary set apart for infectious cases. There had, however, been no magistrate's order for the child's removal, and on that ground (apart from the question of the father's liability to pay for her at all), the judge was obliged to decide against the claim.

It certainly seems as if the law might, with advantage, be amended so as to secure payment of the expenses incurred in treating patients whose families are in a position to afford it. It is, however, both the moral and the legal duty of local authorities to take steps to secure the proper treatment and isolation of all infectious cases, as far as possible; and even where they fail in recovering the cost of maintaining such patients in their hospitals, they and the ratepayers may consider such money as well expended, if it secures the removal of a patient who might have become a source of infection to the neighbourhood.

THE NUISANCE CAUSED BY RAILWAY-WHISTLES.

WE recently called attention to the rights and liabilities of those persons who choose to keep animals which annoy the neighbourhood by the noise they make. Letters have since then appeared in the *Standard* complaining of the much more serious annoyance produced by the constant shrieking of railway-whistles on the suburban lines. It has been asserted that a crowing cock or a barking dog is a nuisance injurious to health, on the ground that it may deprive an invalid of necessary rest; and there can be no doubt that the same remark applies to railway-whistles. The objection to the animals applies, however, with much more force to the whistle, because it is so much louder and more penetrating, and consequently can exercise so much greater a disturbing influence.

Both in common estimation, and also by English law, any loud and continuous noise which interferes with business or with the enjoyments of life, is a nuisance; and if such a nuisance is caused by any person who has no right to cause it, an action may successfully be maintained against him in respect of it. For instance, there is a case on record where such an action was successfully brought to abate the nuisance caused by ringing church bells; but such actions would generally fail on the ground that there was a prescriptive right to ring the bells, and consequently that the person aggrieved would have no right to complain. It is generally supposed that the railway companies have a right to blow their whistles, and consequently that those persons who are annoyed or injured by the practice have no remedy. The companies obtained the land on which their lines are constructed under Parliamentary powers, for the purpose of using them as railways; and it has long been settled law that no one has a right of action against them merely because, from the proper exercise of their Parliamentary powers, he has sustained damage. In an old case of 'The King against Pease' it was held that, though the engines on a railway by frightening the horses on an adjoining highway caused what is regarded by our law as a nuisance, still that nuisance was authorised by the statute under which the railway was constructed, and consequently that the company was not liable. This exception, however, extends only to the proper and careful doing of the acts so authorised, and in a subsequent case an action was suc-

cessfully brought against a company to recover damages consequent on an engine-driver suddenly letting off steam close to a place where the line crossed a road, and so causing a horse to take fright. We believe that there have also been cases where the companies have had to pay damages for frightening horses by whistling, but we cannot find them reported.

If persons with statutory powers improperly exercise them in such a way as to cause not merely temporary injury to individuals, but a continuing nuisance to them, or still more to a neighbourhood, the Courts will not merely give damages to the persons aggrieved, but will grant injunctions prohibiting the continuance of the nuisance. The cases in which this has been done are not at present very numerous; but the principle on which such injunctions may be granted was much discussed, and may be taken as having been now settled by the judgments of the House of Lords in the Hampstead Hospital case. If the action of the body purporting to act under Parliamentary powers causes a nuisance, it is not justified, unless it is apparent that those powers could not be exercised otherwise. No one can pretend that the constant sounding of a railway-whistle is necessary for the purpose of conducting the traffic. Trains might run, and in many places do run, without the whistle being used at all. In America the engines carry a large bell, which is used for the purpose of warning the signalmen and the public that a train is coming; the whistle is reserved for the purpose of frightening stray cattle off the rails and other similar emergencies. In populous districts in our Country the use of the whistle might well be prohibited. If persons aggrieved would combine to bring a test action against one of the offending companies, an injunction would probably be obtained, and the nuisance abated. There are two recent instances where such a course has been successfully adopted for the suppression of nuisances caused by railways near London. Several actions were brought against the Great Northern Railway in respect of the nuisance and injury caused by their coal yard at Islington. In some of these the plaintiffs failed to show that they personally were damaged, and consequently they lost; but in one case, at least, the plaintiff proved a substantial nuisance, and obtained an injunction, prohibiting the company from so conducting their coal yard as to cause a nuisance for the future. The other instance was that of an action brought to restrain the London Brighton and South Coast Railway from continuing a nuisance, caused by the noise connected with their cattle yard at Croydon. It was proved that the bulk of the nuisance was caused by drovers in driving cattle to and from the yard—for which the company were not responsible—but yet an injunction was granted. In both the above instances the defence of the company was that any injury sustained by the plaintiffs was caused by the exercise of their statutory powers, and that consequently they were protected, and in both instances that defence failed. We have no doubt that it would fail also as regards whistles wherever a strong case of injury and nuisance was proved.

The Corporation of Newcastle have made an application to the Local Government Board for leave to borrow 16,000*l.* for the erection of a new hospital for the treatment of infectious diseases, and 7,000*l.* for the erection of a refuse destructor for that city.

NOTES OF THE MONTH.

OPEN SPACES.

Those who are interested in the question of providing additional open spaces in the crowded parts of London, the second annual report of the Metropolitan Public Garden, Boulevard, and Playground Association (83 Lancaster Gate, W.) will prove valuable. The pamphlet, just issued, reveals fully the useful objects of the Association, but not the several channels into which the energy of Lord Brabazon and his associates has been directed during the past twelve months. Of the seventy-eight important matters taken in hand thirty have been successfully carried through, a result which represents a great amount of hard work. Amongst these successful undertakings is the conversion of part of the disused site of the old Horsemonger Lane Gaol, near Finsbury Causeway, into a splendid public playground for boys and girls, daily used by about 2,000 poorest children, and where perfect order is maintained by two caretakers. Valuable assistance has been given towards the formation of public playgrounds and gymnasia in Stepney, Mile End New, Newington, and Bermondsey. The London Sanitary Board has been urged to extend the use of school playgrounds, and, with the aid of the Association, has appointed a Swedish instructor of physical exercises and a special committee to attend to the physical training of the children. The Duke of Devonshire has kindly allowed the Association to open and maintain the garden of Ebury, Pimlico—a step immensely appreciated in the neighbourhood; and the Marquis of Northampton has done the same with regard to Canonbury, which has been rendered very attractive in so doing. The great advantage of opening up the disused enclosures. Seats have been placed in Finsbury Street, Borough, and in the disused burial-grounds of St. Dunstan, Stepney (where the Association has also provided a caretaker), St. James, St. Andrew, and St. Mary, Lambeth, and through its other burial-grounds have been beautified and made open, including Bunhill Fields and St. George's, Hanover Square; while to it are also due the opening out and opening by the Corporation of new mall gardens at the south-eastern end of Finsbury Bridge, the placing of seats in the Royal Albert, Chelsea, and other works for the public. The Association assisted in opposing the Railway Bill and the appropriation for rail-ways of a part of Barnes Common; it helped to secure Mr. Hollond's 'Disused Burial-grounds Bill' and saved from the builders' hands the disused grounds of Peel Grove, Bethnal Green, the Bones, Borough, Guy's Hospital, and Christ Church, Westminster.

The report includes the Metropolitan Open Spaces Act (1881), the Disused Burial-grounds Bill, and a memorandum of steps to be taken in converting churchyards into gardens, besides three tables and unique lists, one with particulars of Metropolitan burial-grounds, compiled by Miss Gladstone, and two, compiled by Captain Pearson (Secretary), containing details regarding 34 existing open spaces, with remarks upon the success from those who live in their neighbourhood.

The pamphlet ends with a long list of memoranda including many of the leading philanthropists of the day and a large number of the London clergy.

The work, so ably done in the past, is most encouraging, but to continue it an increase in the number of subscribers is much needed. We do not look without hope upon the unsuccessful work of the Association, knowing that, although the desired results may not be immediately attained, public attention has been drawn to the several matters, which must in time produce good fruit.

POISONING BY TINNED FOODS.

POISONING by tinned foods has of late been by no means an infrequent occurrence, and Dr. Nicholas records in a recent report on the health of Wandsworth that many complaints (reasonable foundations for which have been within his own knowledge) have been made of serious illness having resulted from the use of these provisions. Dr. Nicholas believes that, in many instances, the cause of such illness arose from the decomposition which some of such foods undergo from lapse of time. It seems to have been assumed, alike by vendors and purchasers, that these viands, having been hermetically sealed after the exclusion of air, undergo no change for an indefinite length of time. Dr. Nicholas points out, however, that the exhaustion of the air contemplated by the process employed in the manufacture, is not, and indeed cannot, be complete, and the decomposition, however much delayed, must surely and gradually take place. As it is impossible for the purchaser of these foods to determine how long they have been prepared, Dr. Nicholas suggests that some guarantee of their age should be afforded by the stamping of the tins with the date of manufacture, either through the agency of the Board of Trade, or some other Governmental procedure.

This suggestion does not at first sight appear a very promising one; but we think that the whole question of tinned foods—their importation, their constituents, and their influence on health—might profitably receive the attention of the Local Government Board.

CHEAP PUBLIC BATHS.

A FEW months ago Lord Brabazon made an able and eloquent appeal for the provision of public baths and washhouses (*see* SANITARY RECORD, Vol. xv., p. 432), in which he emphasised the duty of providing and maintaining these places as one coming properly within the jurisdiction of local authorities. Lord Brabazon may perhaps take courage from the following notable illustration of the successful inauguration and working of public baths erected by a municipality, as reported by Mr. Francis Vacher in a recent report on the health of Birkenhead. The building is of red brick, and occupies a fairly central situation as regards the whole borough. The accommodation provided consists of a large plunge bath, 47 feet by 32 feet, with 22 dressing boxes, a children's plunge bath, 12 feet by 9 feet, with dressing boxes, and 10 private baths in separate compartments—one male and one female first-class, five male and three female second-class. The children's plunge bath is often available for women, and the large plunge bath is reserved for women on Wednesdays from 6 A.M. to 2 P.M. During the summer months the establishment was kept open from 6 A.M. to 9 P.M., and during the winter months from 8 A.M. to 7 P.M. The charge is from 6d. to 3d. for the large plunge bath, from 1s. to 6d. for the small plunge

bath, 1s. for a first-class private bath, and 6d. for a second-class private bath. The money taken from March 1 to Dec. 31 amounted to 589l. In the week ending August 26 the amount taken was highest, being 27l., whilst the lowest amount taken (2l. 9s. 2d.) was in the week ending Dec. 16. The total sum of the baths given was 29,354. The large plunge bath was by far the most patronised, the number of bathers being 23,990, of whom 327 were females. The staff employed consists of a superintendent and matron, at a salary of 100l. a year, an engineer at 30s. a week, a bath attendant at 17s. a week, a charwoman at 15s. a week, and during the summer months a washerwoman at 15s. a week. The success of the baths during the first year of their existence exceeded the most sanguine expectations of the Council, and their provision proved a rival attraction to the public bowling and quoiting ground in Birkenhead Park. Local authorities possess ample powers for the establishment and maintenance of baths of this description, and it is greatly to be wished that these powers were much more generally availed of.

THE WORKING OF THE ALKALI ACTS.

THE annual reports to Parliament on the working of the Alkali Acts will no longer be illuminated by the quick intelligence and scientific insight of the late lamented Angus Smith. His methods of work might not be strictly official, nor his language quite so polished as that of the accomplished compilers of the annual Blue-books of the Local Government Board itself; but his reports breathed the true spirit of inquiring vigilance, and of the enjoyment of work undertaken more as a labour of love than anything else. The last official product of his pen has recently been published as a Parliamentary paper, and possesses from this circumstance additional, though a somewhat pathetic, interest. It records, what must have been to its compiler a source of genuine pleasure, the steady growth of the principles upon which the Alkali Acts were framed. The total number of alkali and other works in the United Kingdom at the end of 1883 was 990, of which 802 were in England, 140 in Scotland, and 48 in Ireland. Of these, no less than 49 were registered for the first time during the year. The great majority of the new works were for the manufacture of chemical manure and sulphate of ammonia, the increase in the number of the latter works being due to the fact that the owners of the smaller gasworks have discovered that they can more profitably manufacture and sell their sulphate of ammonia than send the bulky gas-liquor to a distance. To this discovery, also, the increased profits which have been made of late years by the carrying on of gas undertakings are no doubt to some extent due; for the manufacture of residuals, when judiciously managed, has in many cases of late years proved scarcely less profitable than the manufacture of the gas itself. In many of the new works, oxide of iron purifiers have been erected as the best means of preventing a nuisance from sulphuretted hydrogen; and in some works this gas is now completely burnt, instead of being allowed, as formerly, to escape unburnt up the chimney into the atmosphere. At one work, Claus' method of dealing with sulphuretted hydrogen by burning it has been introduced, so as to form sulphur, which is collected. The extent to which oxide of iron purifiers are being adopted throughout the country may be gathered from the fact that in one district only they were

introduced into twenty-three works in 1883. Special attention was devoted to alterations and improvements in the treatment of the sulphuretted hydrogen evolved in the manufacture of sulphate of ammonia, and in the washing of the gases emitted in the treatment of coprolites and other materials with sulphuric acid at chemical manure works. As regards alkali works proper, the chief improvement has been effected at Newcastle, where, in six works, the pan outlets have been done away with, and connections made with the chimneys, the suspicion of escape being thus reduced, and the inspector enabled to do his work of testing more speedily. Only one work at Newcastle has now pan outlets.

FORTHCOMING EXHIBITIONS.

IT is an assured fact that we are living in an age of exhibitions, and the great success which has attended those combining amusement with instruction held during the last two seasons at South Kensington, appears likely to promote their extension to provincial centres as well as throughout the metropolitan area. In addition to the Exhibition of Inventions in relation to science and the art of music at South Kensington, an 'International' Exhibition at the Alexandra Palace, Muswell Hill, is promised. Everything that can be consistently offered to exhibitors to induce them to patronise the exhibition at Muswell Hill is offered, including five classes of awards, in which a diploma of honour is the highest prize, gold medals figuring as second awards, while low fares by railway and entrance fees, based on the most liberal tariff, are set forth to attract the public, who are promised amusements and entertainments of the most varied character. The Exhibition is to commence on March 31 next, and to remain open for six months, and the building and grounds will be illuminated by the electric light. One of the most laudable features in the arrangements is that 10 per cent. of the gross receipts from admission money is to be set apart for distribution amongst the principal London hospitals. For this purpose a committee has been formed, including Colonel Sir Herbert Sandford, R.A., as chairman, Admiral Sir Edward Inglefield, C.B., vice-chairman, and General Sir Michael Kennedy, K.C.S.I., Sir Henry Pitman, M.D., Sir Andrew Clark, Bart, M.D., F. D. Dixon Hartland, Esq., M.P., and George Johnson, Esq., M.D., as members of the executive. The bankers to the fund are Messrs. Coutts & Co., the executive commissioner Geo. Collins Levy, Esq., C.M.G., and the secretary Edgar Ray, Esq., the City offices being at 19 & 21 Queen Victoria Street, E.C.

Our American kinsmen have also determined to hold an exhibition in London in 1886 of American manufactures and products only. It is intended to be of a most comprehensive character, and has received the hearty support of the governors of the different States and presidents of the principal railway companies, as well as of representative men in all branches of manufacture and produce. This interesting show will be truly national in character, and in it the English public are promised the opportunity of seeing American artisans (both white and coloured) at work in various handicrafts. For many months past General C. B. Norton, the secretary, has been located at the administrative offices, No. 7 Poultry, E.C., organising the movement. General Norton is no novice in the business.

having been engaged in connection with American exhibitions since that of Paris in 1867, in which he was a commissioner from the United States. The locality where this exhibition will be held is not yet fixed; and if an appropriate building cannot be obtained, a special one will be erected for the purpose. If there is anything to be learned from the modes of procedure in the different American industries, our manufacturers and artisans will thus have an opportunity of profiting by an inspection of them without trouble or outlay—no mean advantages in these times of keen industrial competition. There is also little doubt that London generally will greatly benefit in a pecuniary as well as cosmopolitan point of view from the ingress of Transatlantic visitors.

THE NATIONAL HEALTH SOCIETY.

THE National Health Society is now a corporate body. This step was felt to be a wise one, owing to the fact that the Society has done, and is doing, work of so much use and importance to the public; and therefore an Act of incorporation has been secured. The Council of the International Health Exhibition has awarded to the Society a diploma of honour, and the members have memorialised the Prince of Wales, asking for a grant of money from the surplus funds. Dr. J. J. Pope is lecturing for the National Health Society in Leek, Bedford, and other provincial towns, and several gentlemen of experience have undertaken, during the winter, to give simple instructions to audiences of working men and lads in the East End as to what to do in cases of injury and accident. Dr. Roberts is lecturing in the district of Keighley under the Society's auspices, and a course of drawing-room lectures, especially intended for ladies, is to commence shortly in the west of London. The Sub-committee on Poisonous Dyes has resumed its useful work. The members of the Society have passed a resolution expressing their regret at the proposed destruction of the Sanitary and Insanitary Houses, lately exhibited at the Health Exhibition, and requesting the Committee to consider if it would not be possible to remove them to some position where they could again prove of interest and use to the public.

THE ADVANTAGES OF HOSPITAL ISOLATION.

ONE of the most encouraging evidences of sanitary progress is the increasing provision which is being made by local sanitary authorities in various parts of the country of infectious hospitals for the isolation of cases of infectious disease, and the growing appreciation on the part of the public of the benefits of such hospitals. When inquiring, some time ago on behalf of the Local Government Board, into the whole question of isolation provision and administration, Dr. Thorne Thorne found that, with but few exceptions, these hospitals had been used for the treatment of infected people who, in the absence of any provision of the kind, could not have been isolated at all, and must, therefore, have spread disease to their neighbours. Since the publication of that report some forty or fifty hospitals have been erected in various parts of the country; and the instances recently recorded in these columns leave no doubt as to the favourable change that is taking place in the attitude of public feeling towards them. Of the usefulness of individual infectious hospitals, the past

year has afforded some noteworthy examples. Thus at Ipswich, where the resources of the hospital were severely taxed by an outbreak of small-pox and an extensive prevalence of scarlatina, a total of 85 patients were treated with but one death, the remaining 84 being discharged cured. Since the opening of the hospital in Aug. 1881, the mortality amongst the inmates has been remarkably low, four deaths only having occurred amongst 180 patients. This experience, which is not uncommon, demonstrates the increased chance of recovery which a sufferer possesses when treated in clean and airy wards, attended by trained nurses, and receiving the benefit of skilled medical attendance. It would not be difficult to imagine what would have happened had these 85 people been treated at their own homes, for at Leicester, where the treatment of cases of scarlet fever at home exercises a more or less paralysing influence on the efforts of the local authorities, as many as 797 houses were attacked by scarlet fever in 1883. Dr. Johnston's experience then has proved beyond doubt that when this disease once gains admission into artisan dwellings, it is quite exceptional for any of the younger members of the families to escape it. The patients admitted into the Leicester hospital suffering from this disorder numbered 383, and of these 25 proved fatal; whilst amongst the cases treated at home (estimated at 414) there were 66 deaths. The Birkby Hospital, at Huddersfield, proved, too, of the greatest service in effecting isolation. Here 75 cases were admitted, the majority of admissions being from scarlatina and typhoid fever. The deaths included two from each of these diseases, one from diphtheria and one from tuberculosis. One hundred and twenty-nine patients were received into the Warrington Hospital, and of these 104 were discharged cured, 12 died, and 13 remained under treatment at the end of the year. At Gateshead the Borough Hospital was found most valuable for the isolation of cases of the more dangerous infectious disease. Mr. Green, the medical officer, found that when cases were reported and removed early in the disease, it was extremely rare that other members of the household or neighbourhood suffered. But when cases could not be removed, other cases almost always occurred, and the disease spread. Of the 233 cases admitted for treatment, of whom no fewer than 177 were suffering from small-pox and 46 from typhus fever, 44 proved fatal, or 18·8 per cent. Dr. Bryden Hill, the health officer of Oldham, estimates that as compared with the average of the years 1872-81, there was a saving in 1883 of 333 lives from infectious disorders alone, and he attributes no small part of this to the existence of a fever hospital and the compulsory notification of zymotic disease. We could multiply instances of this kind from the interesting and valuable reports of health officers which are sent to us in such embarrassing profusion; but it is scarcely necessary. The value and utility of infectious hospitals is beyond question; and we are happy to think that the prejudice which formerly existed against their use is rapidly dying out.

THE SMOKE NUISANCE.

AT the present time of the year, when fog-producing causes bring all their influence to bear, it behoves every individual to exert his utmost to restrain every agency for evil in this respect, and it is satisfactory

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to note that the authorities are keeping an ever-watchful eye upon offenders, casual or otherwise. The proprietor of a sugar refinery in Spitalfields was summoned during the past month, under the Smoke Nuisance Act, for using one of his furnaces not so constructed as to consume the smoke, and it was proved that very frequently the neighbourhood of Spitalfields was clouded by the dense volumes of smoke which issued from the defendant's works, the dates and times being given at which the nuisance was observed. The magistrate said that complaints had been made continually since July last, and the defendant had been before the court more than once, so that he really appeared to be a frequent offender. Under the Act a double penalty was to be imposed for each successive offence, and the recalcitrant and impenitent 'refiner' was therefore fined a sum of 20*l.*, and ordered to pay in addition costs amounting to 1*l.* 13*s.* 6*d.* According to the Report of the Council of the National Smoke Abatement Institution recently issued, it is stated that the past year may be considered to be the first year in which the movement has worked in an organised manner, and has had the opportunity of indicating and developing its practical utility, and if the foregoing instance may be taken as an example of its procedure, there can be no doubt as to the efficiency of the members, and of the results which, as might be expected, are making good headway. Owing to well-applied efforts, both in London and the provinces, other successful action has been taken, and local authorities are diligently carrying out their powers. The efficacy and economy of gas-engines are becoming generally known, and these cleanly and active machines have increased in number very rapidly during the past three years. The total number now at work in London is estimated at upwards of 6,000, and thus a considerable quantity of smoke has been prevented by their use. Referring again to the Report, it was stated by the trades' deputation who recently waited upon the Council, that for fuel gas is generally more expensive than coal at present prices, and therefore the deputation begged that the Council would represent the case to the gas companies of the metropolis, and invite the directors to consider whether a reduction in the price of gas supplied for *trade* purposes could not be made, the quantity of gas now used being very considerable, and likely to be largely increased by a reduction in the price. The competition of electric lighting having awakened the gas companies to a sense of their position, it is more than likely that a suggestion of this kind will obtain the hearing and attention that it deserves. The improvements in domestic grates, and the extension of heating by hot water, are too well known to be recapitulated; but it may be useful to remind householders that the newer forms of stoves are fully 20 per cent. superior in efficiency and economy to those of even three years past. Legislation, however, is hardly keeping step with the increase of knowledge and interest which are brought to bear upon the subject, and in London it is necessary that the area now covered by the Smoke Abatement Act should be extended, that all the trades which do not at present come within the operation of the Acts should be included, as should also be domestic dwellings which are much to blame; and further that the smoke of steamers on the river, which is now enormous, and practically unchecked, should be brought under control, and the smoke from the locomotive engines on the railways throughout the

metropolis should also be restrained. They are not alone in hoping that these changes will receive the immediate attention of the Legislature.

THE BOUNDARY COMMISSION

THE Government is sanguine if it imagine a Boundary Commission, even with the sphere of operations described by Sir Charles Dilke, is likely to accomplish its labours in any less than the two months that is allotted to it. It is a substantial portion of the work has already been done whilst the Redistribution Bill was in embryo, but a great mass of cutting and grinding will nevertheless have to be got through before new constituencies can be pieced together. However, it is a matter in which we have a direct interest beyond that felt by most people in the distribution of prizes; but what does concern nearly is the disheartening nature of the suggestion of Sir Charles Dilke to Mr. Borslase's excellent practical suggestion to assign to the Boundary Commissioners the function of mapping out districts for the purposes of local sanitation, as well as for political representation. The memory fresh upon us of the tantalising prospect of local government reform with which the Local Government Board presented the House at the beginning of last year must refuse to believe that Sir Charles's re-interpretation of the Commissioners' duties was by anything more than a very natural desire to keep the redistribution arrangements as possible from disturbing or delaying them. His sympathies with a reform of the consolidation of areas are too pronounced to turn an absolutely deaf ear to Mr. Borslase's suggestion. We have all of us heard—little too much—of the great area question. Mr. Goschen's dictum concerning it. The messiness of the subject will not, however, prevent chaos of jurisdiction among local authorities. By all means let the Boundary Commissioners through their work with what celerity they can; let them not afterwards be disbanded for want of experience, and the copious materials at hand, have been utilised in framing a scheme for the redistribution of areas for the purposes of local self-government.

THE SALE OF HORSEFLESH AS FOOD IN BIRMINGHAM.

CONSIDERABLE commotion has been caused by the seizure of a large quantity of horseflesh from the premises of a butcher in the central part of the town, such flesh being so unwholesome as to be promptly condemned and destroyed. Consternation was not lessened by the fact that the flesh was evidently intended for sale as human food either in the shape of joints, boned meats, or mince. It appears that the suspicions of the sanitary officials had been aroused to the fact that a trade in horseflesh was going on between Birmingham, Liverpool, and Manchester, in the latter places the Corporation had some by-laws for the consideration, one of which it is understood forbids the sale of horseflesh in a sound state to be sold as food if it be legibly labelled as what it is. Accordingly, on Nov. 22, an inspector of nuisances, William Latham, visited one of the railways

saw a hamper, fastened with copper wire, with a most offensive odour proceeded. A letter attached to the hamper bearing the address of Mr. Arthur Leeson, Lawley Street, Birmingham, was left till called for. Carriage paid.

The actor watched the hamper and a barrel accompanied it for some hours, at the expiration of which he saw a man drive to the station and take the hamper and barrel. The officer followed him to the packages to a shop situated No. 74, High Street, Birmingham, which had written over the door 'Beef and Mutton Company.' Having seen the support of another officer, Latham went into the shop and questioned the man who had fetched the hamper to the station as to the contents. Ignorance was expressed on this subject, but eventually the packages were opened. The hamper contained packages of raw horseflesh in a wet condition, with an appearance as though the animal had died from inflammation and died. In the barrel were thirty-three pieces of horseflesh in brine. The packages were afterwards seen by the veterinary inspector and the borough medical officer, and condemned for food. Other empty packages of a kind were found on the premises, but no horseflesh. On Tuesday, the 2nd inst., Richard Pearson, a butcher, was summoned to the St. James Police Court, before Mr. Kynnersley, stipendiary magistrate, to answer a charge of selling his premises thirty-five pieces of horseflesh for sale as food, and unfit for human consumption. Evidence was given to the above effect. Latham stated that the horseflesh was boned, and that although it was not known whether the packages were made on the defendant's premises, the horseflesh in the course of being manufactured into sausages in the town. It was sought in cross-examination that the flesh might not have been intended for cats and dogs; but the fact was that in that case it would not have been in brine. For the defence it was contended that the hamper and barrel were consigned to the defendant's son-in-law, that the defendant had no guilty knowledge of the contents of the packages, which he had not even opened when the actors entered the shop, and that it had not been proved that the defendant intended offering the packages for sale. The result was that the stipendiary magistrate dismissed the summons. On another occasion it is well known that the officers should not allow themselves to outrun their discretion in matters of this kind: be careful that their proof is sufficient to bring the affair to a crisis. Since the case was written, it has been determined by the court to appeal against the stipendiary's

refused to pay the rates demanded. That decision has since been followed by other judges, and it seems that the ratepayer must at any rate take steps to bring his dispute before two justices, the proper tribunal for deciding it, and cannot content himself with refusing to pay more than he considers the proper valuation. If he does, he may find himself and his dependents left without any supply at all. The prudent course is to pay *under protest*, and proceed as soon as may be to have the assessment settled by justices. This may entail trouble and some expense (though, if the reduction claimed is obtained, the justices generally allow costs), but no other course is safe.

Actions have recently come on for trial in different county courts in which consumers, who have succeeded in getting their assessments reduced, have tried to recover back the moneys which they had overpaid before the reduction. Such moneys were paid under the mistaken belief that they were legally due at the time they were paid, and ordinarily money paid under a mistake of law cannot be recovered. As far as we have seen the decisions have all been given in accordance with this principle, against the claimants and in favour of the companies. The question will probably in time be brought before the High Court by way of appeal. It is never safe to prophesy; but unless there should be some special circumstances to alter the matter, we anticipate that these decisions will be upheld, and that ratepayers who have now got their rates reduced must be satisfied without getting back any money which they paid in the past. This does not of course apply to money paid under protest while disputes are pending, in order to avoid a distress or the supply being cut off; such money was held by Mr. Chalmers, the County Court Judge of Birmingham (in the case of *Smith v. The Corporation of Birmingham* decided by him Dec. 5, 1884), to be recoverable, while overpayments made previously without protest were not recoverable.

THE LOCAL GOVERNMENT OF LONDON.

THE Council of the London Municipal Reform League have buoyant spirits. They have passed a resolution which in effect calls upon the Government to give early and sustained attention to the question of the Local Government of London, in order that a Bill settling the question once and for all may be passed in the next Session of Parliament. We have every sympathy with the objects of the League; but no great opinion of their political foresight or discretion. The hatching of the Redistribution Bill by the joint incubation of the leaders of the two parties appears to have lulled to sleep most of the apprehensions which were so freely expressed a month or so ago as to the political struggles of next Session. But have these good easy people reflected that something like a fourth of the whole House of Commons are invited to give themselves the happy despatch? Even supposing that the debates on the Redistribution Bill are less lengthy than there is reason to expect, with what spirit will a moribund Parliament, conscious that it only exists on sufferance until the equipment of the new electorate can be completed, take up a question so large and so embarrassing as the municipal reform of London? We yield to no one in dissatisfaction with the existing state of things and desire to see a better; but let us be reasonable in the matter. A Bill like the Home

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WATER RATES.

As between water companies and their customers, till continue, and for the most part the rates that are brought forward are the same as those which we have already commented. There are, however, two points which have recently come under our notice which deserve special attention. In our last month's number we noticed a case in which the High Court refused to grant an injunction to restrain a company from exercising its legal power of cutting off the supply, where the water rates, alleging the charges to be excessive,

Secretary's could only be safely piloted through the shoals and quicksands of the present Parliament by a sacrifice of a good deal of the cargo. In the next Parliament, the metropolis will be numerically and positively much better represented than at present. Let the electors of each of the fifty-seven new metropolitan constituencies make the municipal reform of London a test question for candidates. A solid phalanx of members pledged to such reform could carry through a comprehensive and statesmanlike measure in the first session of a new Parliament, whilst to attempt to force a solution of the question next year would inevitably mean a spineless, truncated and generally inefficient measure as an alternative to nothing at all.

SALE OF BREAD BY WEIGHT.

ENGLISH law does not as a rule interfere with the way in which a tradesman conducts his business. He is generally free to sell his goods in such shape, in such quantities, and of such quality as he thinks fit, and the customer is left to make his own bargain or abstain from purchasing if he does not like the tradesman's terms. There are, however, some exceptions in which, for the benefit of the community, Parliament has thought well to impose certain restrictions. For instance, dealers must have weights and measures of specific denominations, and are liable to heavy penalties if those weights and measures are inaccurate. So also, in case of drugs and articles of food and drink, the dealer is liable to penalties if he adulterates them, or if he sells them not being in nature and substance the articles demanded by the purchaser. The law as to adulteration does not, however, extend to all articles. A draper may sell a piece of cloth which contains little or no wool, or a cutler a knife whose blade is iron instead of steel, and unless he has warranted or fraudulently represented the article as being something which it is not, the law cannot interfere with him. The law also punishes dealers who sell articles of food which have become unsound or unwholesome, although not adulterated. In the case of bread the purchaser is further protected by provisions which oblige the dealer to sell by weight. These provisions are contained in an Act passed in the year 1836, 6 & 7 Wm. IV., c. 37, which repealed previous statutes imposing more severe restrictions. It allows bakers to sell bread in loaves of such weight and size as they like, but forbids the sale of bread otherwise than by weight, except such bread as is usually sold under the denomination of French or fancy bread or rolls. In order to carry out this requirement as to sale by weight, the Act also requires all bakers or other sellers of bread to provide in their shops proper scales and weights, &c., 'in order that all bread there sold may be from time to time weighed in the presence of the purchaser;' and also that every cart or carriage employed for delivering bread shall be constantly provided with scales and weights, &c., 'in order that all bread sold may from time to time be weighed in the presence of the purchaser.' The object of these sections is clearly that the purchaser may have an opportunity of seeing that he gets the weight he pays for, and of testing that in the presence of the dealer or his agent, so that incorrect weights may be detected and put right at once. It is not necessary to weigh every loaf in the presence of the customer, but the baker is liable to a penalty if he sells anything but

the full weight, and is bound to provide scales for weighing, and to weigh the loaves when required. The provision as to carrying scales in carts is one which bakers apparently neglect and wish to get out of, for on two occasions at any rate they have thought it worth while to dispute it as far as appealing to the High Court, each time unsuccessfully. In the year 1875, in the case of *Robinson v. Cliff*, the point urged was that bread supplied under a general order given at the shop need not be weighed from the cart; and the other day, in the case of *Ridgway v. Ward*, the baker contended that where a loaf had been ordered and weighed (in the absence of the customer) in the shop, there was no necessity to have any scales in the cart. As these contentions failed, it may be taken as now settled that the law obliges bakers to carry scales and weigh bread at the time of delivery, if required. Bakers complain that this law acts unfairly on their trade, and say that they ought no more to be obliged to weigh bread at their customers' houses than a butcher is obliged there to weigh his meat. Perhaps the law might advantageously be altered by obliging the butcher and other tradesmen who sell goods by weight and measure to weigh or measure them on delivery, when required to do so by the purchaser. As far as we know, the only other traders who are now by law subject to any such obligation are coal-dealers in London, and, judging by newspaper reports, the scales they have to carry are sometimes the means of detecting very serious short deliveries. Any restrictions which make fraudulent malpractices difficult, which oblige the would-be dishonest tradesman to give his customer both the quality and quantity of goods he professes to sell, seem to us to be good. Honest men have no reason to complain of them, except in cases where they omit to observe them through carelessness. And carelessness, even where it is not culpable, deserves no special sympathy. We hope to see the law as to these matters made more stringent, rather than to see it relaxed.

HYGIENIC COMPARISON OF GAS AND ELECTRIC LIGHT.—It is stated in the *Centralblatt für Elektrotechnik* that experiments have been made at the Theatre Royal of Munich in order to determine the elevation of temperature and the amount of carbonic acid under illumination by gas and by the electric light. Before the play, at the time of the experiments, when there were no more than ten or fifteen persons in the building, the curtain was raised and all the lamps were allowed to burn for an hour. The temperature was observed, at intervals of five minutes, simultaneously in the parquet, in the balcony, and in the third gallery. During the plays, when there were on an average between 500 and 600 persons in the theatre, the thermometer was observed every ten minutes. The experiments showed that the electric light greatly diminishes the increase of temperature. It does not render ventilation superfluous, but it requires a less active ventilation than gas, since it does not, like gas, contribute to the carbonic acid and to the increase of heat.

THE Dean and Chapter of Durham have offered a free acre of land on Gillesgate Moor to the Corporation of that city for the purpose of erecting a permanent hospital for the treatment of infectious disease; the only condition attached to the gift being that the proposed building should be erected at once. Small-pox is sensibly declining in the above city. Dr. Vann, the medical officer in charge of the temporary hospital for infectious diseases, reported at the last monthly meeting of the Council that there were only 49 cases in that building, mostly young persons.

THE PUBLIC HEALTH

DURING NOVEMBER 1884.

The temperature during the month of November at Observatory, Greenwich, was $42^{\circ}4$; it slightly the average November temperature in one ears, but was below that recorded in the corresponding month of any year since 1879. An excess of the prevailed on thirteen days of the month, the other seventeen days it was below the The warmest day of the month was the 5th, mean was as high as $55^{\circ}5$, and $9^{\circ}9$ above the; the coldest day was the 25th, when the only $30^{\circ}7$, and $10^{\circ}2$ below the average. measured at Greenwich on thirteen days month, to the aggregate amount of one inch, less than half the average November rainfall in years. During the first eleven months of this rainfall amounted to 15.5 inches, which was as 8 inches below the average rainfall in the same year-one years. The sun was above the horizon 4.4 hours in November, but only 29.0 hours of shine were recorded at Greenwich; this amount derably below that registered in the corresponding month of any year on record. The direction was very variable throughout the month.

Twenty-eight large English towns dealt with by Registrar-General in his weekly returns, which have a population of more than eight millions and 800,000, 22,718 births and 14,580 deaths were during the four weeks ending the 29th ult. The birth-rate, which had been 33.3, 34.4, and 34.9 per 1,000 in the three preceding months, declined again to 32.8 in November, but slightly exceeded the rate in the corresponding month of the preceding year.

In these twenty-eight towns the lowest birth-rate was 28.4 in Brighton, 28.5 in Plymouth, 28.6 in Bolton; in the other towns the rates ranged from 38.4 in Hull, 39.6 in Cardiff, and 40.2 in London; the birth-rate in London last month was equal to 1,000, while it averaged 34.8 in the twenty-eight provincial towns.

The annual death-rate in the twenty-eight towns, declined from 24.2 to 20.5 per 1,000 in the preceding months, rose again to 21.7 during November.

This rate, however, was below those recorded in the corresponding periods of the two preceding years, 1883, which were 22.4 and 22.6 per 1,000 respectively.

The lowest rate of mortality last month in the twenty-eight towns was 17.7 in Brighton. The rates in the other towns, ranged in order from the lowest, were as follows: Portsmouth, 19.2; Bristol, 19.4; Birkenhead, 19.9; Plymouth, 20.0; London, 20.3; Manchester, 20.7; Sheffield, 20.7; Blackburn, 20.7; Leicester, 21.1; Bradford, 21.9; Leeds, 22.1; Salford, 23.0; Oldham, 23.3; Halifax, 23.8; Hull, 24.0; Newcastle-upon-Tyne, 25.5; Wolverhampton, 25.5; Cardiff, 26.0; Nottingham, 26.4; Bolton, 27.8. While the death-rate in London, as above stated, exceeded 20.3 per 1,000, it averaged 22.9 in the other provincial towns. The 14,580 deaths from the twenty-eight towns during the four weeks ending the 29th ult. included 1,547 which were referred to the zymotic diseases, of which 303 resulted from measles, 284 from whooping-cough, 200 from scarlet fever, 208 from diphtheria, and 129 from small-pox. 17 deaths were equal to 10.6 per cent. of the total, and to an annual rate of 2.30 per 1,000. The death-rate showed a slight decline from that of the preceding month, and was below those recorded in the corresponding periods of the two preceding years, which were 2.94 and 2.81 per 1,000 respectively. The death-rate in London during November

was 2.13 per 1,000; in the twenty-seven provincial towns it averaged 2.45, and ranged from 0.5 in Brighton, 0.5 in Plymouth, and 1.0 in Bristol, to 3.8 in Hull, 4.3 in Bolton, 5.1 in Preston, and 7.5 in Cardiff.

Scarlet fever was the most fatal zymotic disease in the twenty-eight towns during November. The rate of mortality from this disease in the twenty-eight towns, which had been 0.41 and 0.38 per 1,000 in the two preceding months, rose again to 0.45 during November, but was considerably below that recorded in the corresponding period of either of the two previous years, when it was 0.75 and 0.84 per 1,000 respectively. In London the death-rate from scarlet fever was 0.43 per 1,000, and slightly exceeded the average rate in the twenty-seven provincial towns, among which the highest rates were recorded in Salford, Sheffield, and Newcastle-upon-Tyne. The death-rate from measles, which had been 0.27 per 1,000 in each of the two previous months, rose last month to 0.42; in London the mortality from this disease was 0.31 per 1,000, while in the twenty-seven provincial towns it averaged 0.52, and showed the highest proportional fatality in Hull, Bolton, and Cardiff. The rate of mortality from whooping-cough, which had steadily declined from 1.10 to 0.30 per 1,000 in the seven preceding months, rose again during November to 0.37; this disease was almost twice as fatal in the provincial towns as in London, and was most prevalent in Leeds, Oldham, and Preston. The death-rate from 'fever' (principally enteric or typhoid), which had been 0.38 and 0.41 per 1,000 in the two previous months, declined last month to 0.35; the highest rates from this disease were recorded in Blackburn, Leeds, and Derby. The mortality from diarrhoeal diseases showed a further decline, and was below the average for the same periods of recent years. The death-rate from diphtheria corresponded with that in the preceding month; this disease was considerably more prevalent in London than in the provincial towns; 81 cases occurred in London, 16 in Liverpool, and 5 in Nottingham. During the four weeks of November 129 fatal cases of small-pox were recorded in the twenty-eight towns, showing a further considerable increase upon the numbers in the two preceding months; of these, 120 occurred in London, 4 in Birkenhead, 3 in Sunderland, 1 in Leeds, and 1 in Cardiff. Judged by the returns of the Metropolitan Asylum Hospitals, the prevalence of small-pox in London showed a marked increase during November. The number of small-pox patients under treatment in these hospitals, which had declined from 1,290 to 536 at the end of the four preceding months, rose again to 884 at the end of November. The average weekly number of new patients admitted to these hospitals, which had been 73 and 84 in the two previous months, rose during November to 203.

The rate of infant mortality in the twenty-eight towns, measured by the proportion of deaths under one year of age to births registered, was equal to 157 per 1,000 during November, against 156 and 162 in the corresponding periods of the two preceding years, 1882 and 1883. While the rate of infant mortality did not exceed 143 in London, it averaged 157 in the twenty-seven provincial towns, among which it ranged from 93 and 122 in Portsmouth and Derby, to 195 in Nottingham, 220 in Preston, 232 in Cardiff, and 245 in Bolton.

The death-rate from diseases of the respiratory organs, judged by the metropolitan returns, was considerably below the average during November. The weekly number of deaths referred to these diseases in London averaged 398, and the annual death-rate was equal to 5.2 per 1,000. In Liverpool the annual rate of mortality from these diseases was last month equal to 7.7 per 1,000.

The causes of 372 of the 14,580 deaths recorded in the twenty-eight towns during the four weeks of November were not certified, either by registered medical practitioners or by coroners. These uncertified deaths were equal to 2.55 per cent. of the total deaths, which exceeded the proportion in any recent month. In London the pro-

portion of uncertified deaths did not exceed 1·37 per cent., while it averaged 3·44 in the twenty-seven provincial towns, ranging from 0·0 in Plymouth, and 0·5 in Cardiff, to 5·8 in Halifax, 6·4 in Oldham, and 7·5 in Hull.

Among the population living in the outer ring of suburban districts around London, estimated at rather more than a million persons, the death-rate during November from all causes was equal to 18·5 per 1,000, against 17·7 and 17·8 in the corresponding periods of 1882 and 1883. During the four weeks ending the 29th ult., 59 fatal cases of small-pox, 41 of diphtheria, 20 of whooping-cough, 20 of measles, 16 of scarlet fever, 10 of 'fever,' and 9 of diarrhoea, were recorded in the outer ring. These 175 deaths were equal to an annual rate of 2·12 per 1,000, which slightly exceeded that recorded in the corresponding month of last year. The fatality of whooping-cough and of 'fever' declined, while that of each of the other zymotic diseases showed an increase. Of the 59 deaths from small-pox recorded in the outer ring during November, 54 occurred in West Ham district (including 20 of London residents recorded in the Metropolitan Asylum Hospital at Plaistow), 1 in Staines, 1 in Isleworth, 1 in Tottenham, 1 in Acton, and 1 in Willesden sub-districts. Of the 41 fatal cases of diphtheria 11 were registered in Kingston, and 7 in Edmonton districts.

NOTIFICATION OF INFECTIOUS DISEASES.

THE table on page 269 contains uniform statistics relating to sickness and mortality in thirty-one of the thirty-nine urban sanitary districts of England and Scotland in which the notification of infectious diseases is compulsory. The population of the thirty-one towns for which we are enabled to publish complete statistics for the month of November is estimated at about two-and-a-half millions of persons. The annual death-rate from all causes during that period in these thirty-one towns averaged 21·91 per 1,000 persons estimated to be living therein, showing a further decline from the rates recorded in the two preceding months, which had been 22·55 and 20·51 per 1,000 respectively. The rate of mortality in the twenty-eight large English towns dealt with by the Registrar-General in his weekly returns was 21·70 during November, and therefore was slightly below the rate in the thirty-one towns in the accompanying table. The death-rates last month were considerably below the average in Barrow-in-Furness, Hartlepool, Edinburgh, and Accrington; while they showed an excess in Nottingham, Warrington, Stalybridge, Preston, and Jarrow. The death-rate from the eight infectious diseases dealt with in the table averaged 0·91 per 1,000 in the thirty-one towns, against 0·54, 0·77, and 0·98 per 1,000 in the three preceding months. No death from any of these infectious diseases was recorded last month in Lancaster, Leek, Macclesfield, Stalybridge, and Warrington; while in the other towns the rates ranged upwards to 2·00 in Bury, 2·03 in Hartlepool, 2·15 in Greenock, and 4·39 in Rotherham. Four deaths were referred to small-pox in Birkenhead; scarlet-fever was proportionally most fatal in Bury, Salford, Greenock, and Rotherham; enteric fever in Blackburn, Preston, Bury, and Derby; and diphtheria in Aberdeen, Burton-upon-Trent, and Greenock. Two deaths from typhus fever were recorded in Bury. With regard to the notified cases of infectious diseases in these thirty-one towns, it appears that the proportion to the population of persons reported to be suffering from one or other of the eight diseases specified in the table was 6·71 per 1,000, against 6·85 and 7·92 in the two preceding months. While the proportion did not exceed 0·94 in Warrington, 1·67 in Huddersfield, and 1·95 in Macclesfield, it ranged upwards to 10·00 in Salford, 11·49 in Hartlepool, 11·53 in Derby, 12·28 in Edinburgh, 12·41 in Barrow-in-Furness, and 18·65 in Rotherham. The excessive rate recorded in the three last-mentioned towns was due to the epidemic

prevalence of scarlet-fever. Thirty cases of small-pox were reported in Birkenhead, and only one in any of the towns—viz. in Leicester. Scarlet fever showed the proportional prevalence in Salford, Edinburgh, G and Rotherham; enteric fever in Accrington, Blk Derby, and Hartlepool; and diphtheria in Bury, Trent and Aberdeen. Three cases of puerperal fever were notified in Salford during last month.

We are deeply grateful to those medical officers of health who so obligingly and regularly forward statistics as to disease-occurrences in their districts. We wish we could induce their colleagues who have yet responded to our appeal to follow so excellent example. We confess we should much like to fill the ominous blanks in our table filled up. May we meet with the New Year, our friends, the health officers, places against the names of which we have sorrowfully put inexpressive dashes, will make an effort to supply with the very moderate amount of information which we ask, and send it to us in time for publication in the RECORD? There are difficulties no doubt in the way. There is an overbearing or suspicious committee; or an insufficient staff; or, perhaps, it is a venture to hint it, an imperfect appreciation of the value of figures on the part of the health officer. The mere piling up of statistics for only vainglorious display is of course sheer waste of time. But our tables have more practical objects than this. It is surely necessary for us here to rehearse what those objects are. The tables speak for themselves, not only as disease records but also as disease forecasts.

We have strong hopes that when the notification of infectious diseases throughout the country comes within the range of practical politics, whenever that desideratum may be reached, these same tables may prove to the unbelievers the practical advantage of a conspicuous economy of notification.

There is promise that even so early as next session may receive Parliamentary attention, for as six corporations are prosecuting Bills in the forthcoming session which contain powers for the compulsory notification of infectious disease. Three of these are populous places in the north—Sunderland, Wakefield, and Wigan; three are health resorts of considerable importance—Eastbourne, Ramsgate, and Southport.

Now it is worth remark that among the defaulters in our table there are two seasons both of which have possessed notification powers since 1879. We believe we are betraying no secret when we say that the reason why we cannot have disease statistics from these places, is because the local authorities would do injury to health-resorts if the notification of infectious disease in them became general. Surely more harm would be done to any sea-resort by indefinite rumours which, in the absence of statistics, there are no means of satisfactorily refuting. Brighton fell into this error last year, and with notification clauses which it had inserted in its trust that Eastbourne, Ramsgate, and Southport would be more courageous, and learn that in the frankest and the fullest safety.

THE Finchley Main Drainage Scheme, submitted by G. W. Brumell, engineer and surveyor to the Finchley Local Board, has been sanctioned by the Local Government Board, and permission has been given to borrow money for the works, the estimate of which (including purchase of land for outfall) amounts to 60,000*l.* Owing to the peculiar feature of the site it is necessary to construct a sewer in tunnel 120 feet from its western side to the outfall site on the eastern side. The works are to be carried out forthwith. At a meeting the Board marked their appreciation of Mr. Brumell's services in the preparation of the scheme, and remunerated him with the sum of 175*l.*, and added to his salary of 50*l.* per annum.

— THE SANITARY RECORD FOR NOVEMBER 1884.

— THE SANITARY RECORD FOR NOVEMBER 1884.

Towns.	Estimated Population Middle of 1884.	Small-pox.		Scarlet Fever.		Diphtheria.		Typhus Fever.		Enteric Fever.		Cholera.		Relapsing Fever.		Puerperal Fever.		Totals of Preceding Columns.		Annual Rate per 1,000 Persons Living.		Deaths from other Zymotic Diseases.				Total Mortality from all Causes per 1,000 Persons Living.
		Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Ill-defined Fever.	Measles.	Whooping-Cough.	Dysentery.	
Aberdeen	111,242	—	—	21	2	13	2	9	—	12	—	—	—	—	—	—	—	52	4	59.5	0.44	—	—	7	—	25.52
Accrington	34,000	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—	—	8	2	2.86	0.72	—	—	3	—	18.25
Adwick	50,000	—	—	32	1	2	2	—	—	17	2	—	—	—	—	—	—	51	5	12.41	1.22	—	—	—	—	13.87
Barnsley	90,870	—	—	14	1	2	1	—	—	6	—	—	—	—	—	—	—	49	8	6.56	1.07	—	—	—	—	20.22
Barnstaple	110,500	—	—	11	2	—	—	—	—	36	6	—	—	—	—	—	—	47	8	5.55	0.94	—	—	—	—	20.64
Blackpool	108,988	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bolton	209,564	—	—	28	2	—	—	—	—	—	—	—	—	—	—	—	—	55	8	6.85	0.96	—	—	—	—	25.25
Bradford	209,564	—	—	40	2	—	—	—	—	24	4	—	—	—	—	—	—	38	9	3.81	0.56	—	—	—	—	20.86
Burnley	66,000	—	—	37	2	3	—	—	—	13	3	—	—	—	—	—	—	53	6	8.37	0.95	—	—	—	—	23.23
Burton-on-Trent ..	44,044	—	—	11	2	29	5	—	—	2	—	—	—	—	—	—	—	32	6	8.84	1.66	—	—	—	—	18.23
Bury	57,162	—	—	—	—	—	—	—	—	13	5	—	—	—	—	—	—	24	11	4.37	2.00	—	—	—	—	19.50
Chadderton	71,502	—	—	9	4	—	—	—	—	—	—	—	—	—	—	—	—	83	12	11.53	1.67	—	—	—	—	18.34
Derby	87,668	—	—	47	1	—	—	—	—	96	11	—	—	—	—	—	—	78	12	6.31	0.49	—	—	—	—	21.45
Dundee	150,322	—	—	53	5	18	5	—	—	67	8	—	—	—	—	—	—	253	17	12.28	0.83	—	—	—	—	18.02
Edinburgh	250,615	—	—	103	5	21	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Greenock	72,611	—	—	42	7	3	3	—	—	8	1	—	—	—	—	—	—	54	12	0.69	2.15	—	—	—	—	20.0
Halifax	77,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17	3	0.00	0.68	—	—	—	—	23.36
Hartlepool	18,000	—	—	1	1	—	—	—	—	13	1	—	—	—	—	—	—	17	3	11.19	2.02	—	—	—	—	17.57
Heywood	25,000	—	—	2	1	—	—	—	—	2	2	—	—	—	—	—	—	4	2	1.85	0.68	—	—	—	—	22.37
Huddersfield	86,004	—	—	6	—	1	—	—	—	3	1	—	—	—	—	—	—	11	2	1.67	0.30	—	—	—	—	19.85
Lancaster	29,000	—	—	3	—	—	—	—	—	2	1	—	—	—	—	—	—	5	2	2.35	0.70	—	—	—	—	28.76
Leek	22,210	—	—	2	—	—	—	—	—	1	—	—	—	—	—	—	—	6	—	2.19	0.00	—	—	—	—	18.08
Leicester	13,354	—	—	6	—	—	—	—	—	8	—	—	—	—	—	—	—	58	6	5.40	0.00	—	—	—	—	25.50
Llandudno	13,773	—	—	42	4	7	2	—	—	—	—	—	—	—	—	—	—	—	—	5.70	0.59	—	—	—	—	20.92
Liverpool	29,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	—	—	—	—	—	—	—	—
Macclesfield	37,461	—	—	4	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	1.95	0.00	—	—	—	—	19.49
Manchester	338,296	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	26.40
Newcastle-on-Tyne ..	151,375	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24.10
Norwich	90,410	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22.60
Nottingham	205,298	—	—	41	7	—	—	—	—	26	6	—	—	—	—	—	—	67	13	3.40	0.66	—	—	—	—	26.00
Oldham	122,676	—	—	26	1	—	—	—	—	20	4	—	—	—	—	—	—	46	5	4.89	0.53	—	—	—	—	23.70
Portsmouth	133,039	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17.00
Preston	99,481	—	—	12	2	5	—	—	—	24	—	—	—	—	—	—	—	41	8	5.01	0.48	—	—	—	—	27.03
Reading	45,840	—	—	20	2	4	1	—	—	3	1	—	—	—	—	—	—	27	2	8.14	0.45	—	—	—	—	27.57
Rotherham	35,653	—	—	41	12	1	—	—	—	9	—	—	—	—	—	—	—	51	12	18.05	4.39	—	—	—	—	25.54
Salford	107,140	—	—	127	17	13	1	—	—	45	8	—	—	—	—	—	—	189	27	10.00	1.43	—	—	—	—	22.43
Stafford	22,250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	26.78
Stalybridge	26,773	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	26.48
Warrington	44,512	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	4	—	1.95	0.00	—	—	—	—	—

SPECIAL REPORTS.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

A meeting of this society was held at 1 Adam Street, Adelphi, on Friday, Nov. 21, Dr. T. Orme Dudfield, President, in the chair.

The council presented a report, stating that the council have addressed a memorial to his Royal Highness the Prince of Wales on the utilisation of the surplus fund resulting from the International Health Exhibition, recommending that the following gentlemen be elected honorary members of the society:—Colonel Sir Francis Bolton, C.E.; Captain Douglas Galton, C.B., F.R.S.; Professor Robert Koch, of Berlin; Professor L. Pasteur, of Paris; A. J. R. Trendell, Esq., M.A.

The following gentlemen, proposed by Dr. C. E. Saunders and Mr. Shirley Murphy, were elected as members of the society:—T. L. Ash, L.R.C.P.Ed., M.O.H. Holsworthy and Okhampton, R. S. D.; F. E. Atkinson, L.R.C.P.Lond., M.O.H. Craven Combined (Skipton Rural) District; H. L. Bernays, M.R.C.S., M.O.H. Charlton, Kent; A. S. Bostock, M.R.C.S., M.O.H. Whyke and Boxgrove District; H. Bullock, F.R.C.S., M.O.H. Heston and Isleworth R. S. D.; W. C. Blackett, M.R.C.S., M.O.H. Durham Rural and Brandon Urban District; J. Burke, M.D., M.O.H. Hatfield, R. S. D.; H. Butterfield, M.R.C.S., M.O.H. West Kent Combined R. S. D.; E. N. Carless, M.B., M.O.H. Devizes U. S. D.; E. Hunt Carter, M.R.C.S.E., M.O.H. Chelmsford U. S. D.; A. Clarke, L.R.C.P.Lond., M.O.H. Street U. S. D.; J. W. Cook, M.D., M.O.H. Tendring R. S. D.; C. J. Denny, L.K.Q.C.P.I., M.O.H. Hartley-Wintney, R.S.D.; A. L. Evans, L.R.C.P.Lond., M.O.H. 1st District Hawarden Union; H. J. Fausset, M.D., M.O.H. Tamworth U. and R.S.D.; E. F. Fussell, M.B., M.O.H. East Sussex R. S. D.; R. H. Hilliard, M.D., M.O.H. Aylesbury R. S. D.; W. C. Morris, M.B.Ed., M.O.H. Chester-le-Street R. S. D.; A. A. Napper, M.R.C.S., M.O.H. Hambledon Union; C. Roberts, M.R.C.S., M.O.H. Uxbridge R. S. D.; W. Robinson, M.D., M.O.H. Gateshead; F. Scott, M.R.C.S., M.O.H. Edmonton U. S. D.; W. Stamford, L.R.C.P.Lond., M.O.H. Tunbridge Wells; W. J. Sykes, M.D., M.O.H. Portsmouth Borough; E. J. Syson, L.R.C.P., M.O.H. St. Neots, Stamford, Caxton, and Whittlesea R. S. D., and St. Neots U. S. D.; E. Walford, M.D., M.O.H. Ramsgate U. S. D.; T. Wheeler, M.R.C.S., M.O.H. Bexley U. S. D., and No. 2 District Dartford Union; J. M. Wilson, M.D., M.O.H. Doncaster U. and R. S. D.

The following gentlemen were elected as associates of the society:—Nominated by Dr. Dudfield and Mr. Shirley Murphy—Rogers Field, B.A.Lond., M.I.C.E.; Louis Parkes, M.D.Lond.; Ernest Turner, F.R.I.B.A.; William Weaver, C.E., surveyor to the Vestry of Kensington. Nominated by Dr. Jas. Stevenson and Dr. Dudfield—Mark Judge, A.R.I.B.A. Nominated by Mr. S. R. Lovett and Mr. Shirley Murphy—George Wallace, C.E., surveyor to the district of St. Giles. A paper was read on 'Noxious Trades,' by Alfred Spencer, Esq., of the Metropolitan Board of Works, which will be published in the SANITARY RECORD of Jan. 15, with the discussion which followed it.

GLASGOW SANITARY PROTECTION ASSOCIATION.

At the third annual meeting of the members of the Glasgow Sanitary Protection Society, Sir William Collins in the chair, the annual report by the council was held as read. It stated that the past year had been one of progress and success, and the membership, notwithstanding a number of resignations, due largely to the present bad state of trade, was 343, being an increase of 28 compared with the preceding year. Of those 278 subscribed 17. 1s., and the rest (country houses, banks, public institutions, &c.) paid higher rates. The expectation expressed in last

report, that the work outside Glasgow would increase, had been verified, the work in the country having doubled compared with last year—about 60 coast and houses in various districts having been examined and reported on. Town work had also increased. In the year 155 houses had been examined for the first time, and of these 115 were found to have decided defects. These varied from slight leaks in the pipes to complete stoppages, and pipes with hardly any pretence at being sound. The council were pleased to observe that the Association was being largely referred to as an arbiter between landlord and tenant, numerous cases having come under notice where a house was taken on condition that it was certified to be safe by the engineer of the Association. The advantage of a report from a neutral party, who has no possible interest in what might be done, was largely recognised by the public. The council could speak from experience decidedly on the necessity of annual inspection.

The Chairman, in moving the adoption of the report, said that the Association might almost be looked upon as a surety company, by which members could insure the health of themselves and families for a moderate sum. He believed also that if parties, on looking out for their own safety, were to insist on the landlord giving a certificate that his house was all right, landlords would for their own sake be obliged to employ the services of the Association.

Professor W. T. Gairdner, M.D., said that a real want of such an association, setting aside the fact that a sanitary department could do for them, there was no doubt whatever. A great deal had been said about the subject. He would just mention that he had entered his house in the college for the first time built within six or seven years, at all events it was a temporary one with the new college buildings, and would reasonably have expected to find everything in a state of repair. It so happened that he was not twenty-four hours in the house before he nosed something. He ultimately found a skilled man, with the result that not only his own house but the whole thirteen houses of the college, he completely overhauled again within a year or two after they were built. His own house was a perfect mine of little insanitary defects, and he didn't think much over the line when he said that it cost him 70% or 80% to get the errors put right. No building was therefore no security, and no man could count with comfort on his house being safe unless he joined an association like this. The professor also called attention to the great dangers that beset people at coast resorts in search of health, and remarked that of them, in taking lodgings at the coast, simply themselves into disease. It would not, he said, be reasonable if it were a stipulation in letting lodgings there should be a skilled report as to the sanitary conditions of the houses every year before they were entered.

THE COST OF CLEANSING IN GLASGOW.

THE statement of the revenue and expenditure of the Cleansing Department of the Police Board, with report, for the year ended May 14 last, has been issued by Mr. John Young, superintendent of the department. (See SANITARY RECORD for Sept. 15, p. 11.) The statement embraces all accounts under domestic cleansing or 'manure,' and public-street scavenging exclusive of the cleansing of private streets and drains. In the present balance-sheet the cost of the operations is set down at 33,780*l.* 7*s.* 1*d.* The actual cost was 35,068*l.* The result, therefore, is a surplus of 1,287*l.* 12*s.* 11*d.* The expenditure under scavenging or 'manure,' or public-street scavenging was estimated at 65,568*l.*, whereas the actual expenditure was 65,290*l.* 7*s.* 3*d.*, or 277*l.* 12*s.* 9*d.* less than estimated. On the other hand, the revenue, which was estimated at 30,500*l.*, is now shown to have reached 30,520*l.*, or 1,010*l.* 0*s.* 2*d.* in excess of the estimate.

sent balance cost exceeds the figure for the previous year by 606*l*. This is more than accounted for by the fact that the revenue for the year just ended is 997*l*. under the previous year's revenue, a result caused by the increasing difficulty experienced in making sales of manure. The expenditure has been 391*l*. less than during the previous year. The total amount of sales and charges, including railway carriage, but *minus* deductions, is 31,503*l*. 1*s*. 8*d*. Of this sum 18,386*l*. 5*s*. 1*d*. is for net sales of manure—12,189*l*. 1*s*. 6*d*. for 'city,' and 6,197*l*. 3*s*. 7*d*. for 'long.' The sales effected by agents amount to 8,661*l*. 10*s*. 6*d*., and by the staff of the department 9,724*l*. 14*s*. 7*d*. The balance is made up by railway carriage (recoverable from consignees) and other smaller charges made for goods sold and work performed. The uncollected accounts amount to 4,811*l*. 4*s*. 11*d*., and the unpaid accounts to 6,003*l*. 3*s*. 9*d*. The bad debts written off during the year amount to 24*l*. 5*s*. 11*d*. On the capital account the department is charged interest at the rate of 3½ per cent. per annum, with the exception of the Fulwood Moss item, on which interest is charged at the rate of 5*l*. 13*s*. 8*d*. per cent. The total amount of this account up till May 15, 1883, is 95,921*l*. 9*s*. 8*d*. The additional payments during the year were as follows:—Crawford Street despatch works, 5,236*l*. 11*s*. 6*d*.; St. Rollox workshops, 803*l*. 2*s*. 5*d*.; erect orderly bins, 431*l*. 5*s*., which, with a sum of 27*l*. 3*s*. 4*d*. unpaid at May 15 last, gives a total of 13,119*l*. 11*s*. 11*d*. The daily average number of men actually at work under Mr. Young's management during the year has been 771. The number of stud at May 15, 1883, was 173, as against 179 at May 15 last. The average cost of feeding and litter during the year has been at the rate of 13*s*. 2½*d*. per horse per week, as against 14*s*. 8½*d*. in the previous year. The stock of dry manure on hand at May 15, 1883, was 12,219 tons 12 cwt. During the year there have been removed 185,695 tons 12 cwt. The total domestic refuse collected during the year has exceeded the figures for the previous year by 1,497 tons. The average cartage per working day during the year was 727 tons, exclusive of street watering. During the year there were 53,236 loads, or 17,567,880 gallons of water spread over the streets and roads of the city. During the year there were 210 men employed daily cleansing private streets and courts, and the cost for wages and material has been 10,530*l*. 6*s*. 2*d*. The estimated cost was 9,890*l*. The excess is accounted for by extra work done, chiefly in hose-washing, which was authorised in August last, after the estimates had been made up. The total expenditure under Mr. Young's management during the year has been as follows:—Cleansing—Manure and scavenging, 65,290*l*. 7*s*. 3*d*.; cleansing of private streets and courts, 10,530*l*. 6*s*. 2*d*.; extraordinary expenditure (capital account), 17,198*l*. 2*s*. 3*d*.; public conveniences, 165*l*. 18*s*. 10*d*., and adding total revenue, 31,510*l*. 1*s*. 2*d*., the total amount dealt with during the year amounts to 124,694*l*. 14*s*. 8*d*.

THE NEW FIRE-PROOF BUILDINGS AT ST. PANCRAS WORKHOUSE.

A NEW block of buildings for the enlargement of St. Pancras Workhouse is now being erected at Cook's Terrace, from designs by Mr. H. H. Bridgman, architect, 2 Poultry, E.C., which, when completed, will be unique in workhouse arrangements, as providing a great safeguard against fire and consequent panic. This new addition will consist of four floors of wards, each 80 feet by 40 feet, two wards on each floor, with staircase, lift, and attendants' rooms between them, a ground-floor appropriated to administrative purposes, and an upper central story of nurses' rooms, together with wings at the extreme ends or baths and water-closets—in all six storeys. The floors throughout are constructed on the 'ligno-concrete' system, by Messrs. Clark, Bunnett, & Co., and while being proof against fire from floor to ceiling, although only 6, 7, and 8 inches thick respectively, also appear perfect from a

sanitary point of view. Mr. Bridgman aptly remarks 'That if the example of the St. Pancras guardians and other bodies having control over the erection of public buildings were followed of first obtaining a report, or receiving suggestions from Captain Shaw, the chief officer of the Metropolitan Fire Brigade, by placing the plans of the intended erections before him, as has been done in this case, we should soon cease to hear of the differences and conflicts in regard to altering and adapting existing buildings to meet the requirements of public safety, and fewer, if any, of the disastrous fires and panics that are continually occurring. If, moreover, it were made imperative to obtain such reports, and to act upon them, the satisfaction would be still more complete.' Capt. Shaw's report has been printed, and in it he expresses his approval of the evident care and attention which have been bestowed upon the smallest details likely to assist in securing immunity from fire, or, in the event of its occurring, preventing it extending to serious proportions, as well as with the ample measures provided for its extinction. Captain Shaw, however, suggests that additional staircases may be provided at each end of the building in addition to the central staircase, so as to secure additional means of exit in case of fire or alarm. It is stated that these suggestions will be carried out. It is gratifying to find that the guardians of St. Pancras are so fully alive to the necessity of taking measures to provide for the security of life and to fulfil sanitary requirements. It is to be hoped that their enlightened example will not be unmarked, as in the ligno-concrete manufactured by Messrs. Clark, Bunnett, & Co., there would appear to be a material at command of a very useful character and one deserving of extensive trial.

THE METROPOLITAN PUBLIC GARDEN, BOULEVARD, AND PLAYGROUND ASSOCIATION.

THE ordinary monthly meeting was held at 83 Lancaster Gate, on Dec. 2, Lord Bhabazon in the chair. A grant of money was voted towards the improvement of Ebury Square, Pimlico, which the association is maintaining as a garden, and progress was reported with regard to several important pieces of work now in hand, such as the laying out of St. Bartholomew's Churchyard, Bethnal Green, the formation of a gymnasium at St. Philip's, Stepney, and the preservation of Highgate Woods and of certain disused burial-grounds in Farringdon Street, E.C., Union Street, S.E., and Mount Street, W. The new work taken in hand included the proposed planting of trees in Mile End Road, placing of seats at Christ Church, Westminster, laying out of Carlton Square, Mile End, as a public garden, and opening of gardens in Stepney, Camden Town, and Upper Holloway. On the representation of the Rev. W. Robinson the association undertook to provide a caretaker for six months for the churchyard of St. Mary's, Whitechapel. Several other matters engaged the attention of the meeting, and the second annual report was laid before the members.

PENNY DINNERS.

A CONFERENCE of School Board Managers and Teachers was held at the Society of Arts, Adelphi, on Saturday, Dec. 6, to consider the subject of penny dinners in connection with underfed children. Mr. Sydney Buxton, M.P., presided.

Mr. H. Forbes Clarke, the Secretary of the Sub-Committee of Representative Managers, read a statement of which the following is a summary:—The sub-committee was appointed in June last to consider the subject of cheap dinners in connection with the children attending Board Schools. In August they issued a circular to the representative managers of each school (see SANITARY RECORD for Sept. 15, 1884) to which they have received twenty-nine replies. At the present time fifteen penny dinner centres are in operation, and a dozen or more are in contemplation. As an illustration of the dinners which can be supplied, the following list is given of the dinners

already provided at Albany Place, Hornsey Road, Holloway. The quantities are, as a rule, found quite sufficient by the children. The prices stated are for one hundred dinners, and include the cost of fuel and cooking; no rent is paid. 1. Currant pudding, bread and jam, 8s. 9½d. 2. Suet pudding and jam, bread and cheese, 8s. 10d. 3. Rice (with suet), milk and treacle, bread and jam, 8s. 0½d. 4. Soup (two sheep's head and barley) and bread, 6s. 6d. 5. Potatoe soup (with bones) and bread, 8s. 2d. 6. Bacon (hot) and beans and bread, 8s. 3½d. 7. Bacon (hot) and potatoes, bread, and jam, 8s. 10½d. 8. Irish stew and bread, 6s. 11½d. 9. Soup, and dumplings, and bread, 8s. 1½d. 10. Pea-soup and bread, 7s. 8d. 11. Mutton broth, bread, and jam, 7s. 3½d. 12. Meat, rolly-polly, bread and jam, 9s. 1½d.

It will be seen that the dinners differ in cost, but as one of the committee writes, 'by alternating the more and the less expensive, a mean is maintained for the week.' The cost will vary a little in different districts, according to the sums paid for food and for incidental expenses.

The Chairman said he was pleased to see such a very large attendance, which showed that the subject for which they had met had acquired great interest. The question of penny dinners had only lately become urgent, owing to the large amount of public interest that had been drawn to over-pressure in schools; and he thought that the primary cause of such over-pressure could be traced to insufficient food, in fact that 'over-pressure' was merely another word for underfeeding. His hearers would agree that the Education Department ought not to interfere in the matter. He was glad to welcome Mr. Mundella, who did not come to the meeting in his official capacity.

Although the School Board could not take any active part in the penny dinner movement, the members might lend the schoolrooms, free of rent. He pointed out that of these dinner centres fifteen had already been started, and that twelve were in contemplation, and although some of them might not yet be successful, that was no reason why others should not be started, as at present the movement was really only in an experimental stage, and he had no doubt but that in time the dinners would be quite self-supporting.

Mr. H. Spicer, member of the London School Board, said that for twenty years he had worked in ragged and other schools, consequently he knew something of the lack of food spoken of. Children had come to him, for whom the first thing requisite was something in the shape of a meal; many had come there without a breakfast and gone through the day without anything, not knowing whether they would find food when they got home. He urged that this was not a question either for the Education Department or the School Board, but that it could be solved by voluntary agency. He then moved the following resolution:—'That it is expedient to form a Central Council to assist the Local Committees who have engaged, or are about to engage, in providing penny dinners on a self-supporting basis.' The Rev. J. H. Rose, in a few words, seconded the resolution, which was adopted.

Mr. Mundella, M.P., supported the resolution. He said the question of feeding the children was a more important one than the education question itself, although he did not undervalue education, which was the greatest factor in the future raising of our population. But there was a larger question behind it. We had in our great cities and towns, and especially in London, a class which might in itself almost be considered a caste, which consisted of unskilled labourers who had no regular occupation, but lived from hand to mouth; a number of them were the product of intemperance and a great proportion were steeped in misery. He thought it was a social scandal that no such squalor and misery is to be found in Europe as there was in London, and the only way to wipe out this blot was to train the children. He spoke of the school system in Switzerland where the rich children took the poor children home to feed them. He particularly mentioned two schools in England which had achieved

great success. One was a Devonshire school w Henry Peek (the first organiser of penny dinners five years carried out that system with remarkable success. The other was the Jews' Free School, Spitalfields; 3,100 poor Jews, most of them foreign refugees, 3,200 on the rolls, attend daily, and there is no pressure there because the Jews of the West End after the Jews of the East End. (See page 247.)

He had been to see his friend the Rev. Moore Ede had provided penny dinners at Tynes, who, although a clergyman, was a practical man, and a man of science, and induced him to be present this afternoon. T Moore Ede had provided penny dinners at Tynes he was present recently when 150 to 200 children to dinner, which the children seemed to thorough. The food was very good; in fact he tasted some soup, which was better than some he had at York for a shilling.

A resolution was then proposed by the Rev. Barnett, that the following ladies and gentlemen Central, Council for establishing self-supporting dinners in connection with elementary schools: Geo. Hamilton, Lady Stevens, Mrs. Maitland King, Mr. W. Bousfield, Mr. H. Forbes Clarke, S. D. Fuller, Mr. H. Hoare, Rev. J. H. R. H. Spicer, Major J. Wade, with power to add number. An amendment was proposed by Mr. I member of the London School Board, and carried Mr. Lucraft's and Mr. Murphy's names be added. Mr. Mundella, M.P., consented to act as president and Mr. Sydney Buxton, M.P., as vice-president central council.

The Rev. Moore Ede seconded the resolution was adopted. He gave an account of what he had in connection with these penny dinners in his (Gateshead), where he had provided 13,180 dinners cost of 48l. 2s. 6d. After paying all expenses there was a balance left of 6l. 10s. 9½d.; he could provide at a decidedly less cost than 1d. per head. He the soup which Mr. Mundella praised so much cost for 30 gallons, and if the cost of bread were added 50 pence, it would cost 125 pence to feed 180 children.

In reply to a question, Mr. H. Forbes Clarke average daily attendance at Gifford Street for the weeks was as follows:—97, 130, 157, 157, 217, 217.

THE *Fish Culture Journal* describes a curious experiment made at the aquarium of the National Fish Association at the Healtheries. It had been requested by the Association, on the authority of some American brandy would revive fish on the point of death, mainly too long out of water, and the secretary to test the truth of the assertion. Two Prussian were therefore taken from the tank at the aquarium kept in the air for four hours. At the end of the little brandy and water was administered to one with a feather, and both were then put back into the tank. The fish which had been dosed with brandy revived, but the other floated about on its side, as dead; and to avoid contaminating the water, suppose, it was taken out and thrown aside. The secretary, however, taking up the lifeless fish, opened its mouth, poured brandy and water down its throat, and put it again in the tank, but with little expectation of its revive. For five minutes it floated motionless, but slight evidence of life appeared, and the fish soon to move its fins feebly, and regained by degrees its strength. Neither of the fishes suffered, apparently permanent injury from their experience. This disappointing; born water drinkers like fish should have conducted themselves differently, and to the pernicious effects of alcohol under all circumstances. We remember reading of some pigs, those much used animals, which, when dosed with alcohol, behaved in a manner have been expected of them, and rendered them liable to a fine of five shillings or equivalent imprisonment.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

'Something attempted, something done.'

BEDFORD RURAL.—A noteworthy feature of this report is the account which it contains of the efforts of the sanitary authority to improve the homes of the poorer inhabitants. Few bodies similarly circumstanced can lay claim to a course of action which for a period of eleven years has been so steadily and successfully pursued. In referring to the subject Dr. Prior observes: In these days, when the great and the wealthy are vying with one another to evince their solicitude for the improvement of the dwellings of the working classes and of the poor, it may be as well to let it be known that this work has, for the past eleven years, been strictly kept in view. During that period 186 houses have been reported to the sanitary authority as unfit for habitation, of which some have disappeared entirely, some have ceased to be used as dwellings, some have been enlarged, repaired, or added to—rendered habitable, in fact; and though there still remain many others which are far from being perfect, the representations of the officials have been controlled by a sense of the losses to which agriculture has been exposed, and the additional accommodation required for some of the families whom it has been necessary to remove. Thus the houses reported as unfit for habitation have latterly been, on the average, about twenty annually, while in the first three years they only averaged nine. Overcrowded houses, on the contrary, have diminished materially in number, and it is now thoroughly known in the villages that this form of nuisance, injurious to health and repulsive to decency, can no longer be continued, and the usual subterfuges and excuses have been too often tried in vain to leave much hope of success. As a consequence, the annual average of cases of overcrowding has diminished from 14 per annum in the first three years to between 7 and 8 in the last eight years. There was an increase in the general death-rate, which, however, was not due to the prevalence of any unusual conditions, but rather to the large proportion of aged persons among the population. Diphtheria, which was fatal in nine cases, seems to be establishing itself in the district, whilst, on the other hand, typhoid fever was not nearly so fatal as in the previous year. The zymotic death-rate is estimated at 1·8 per 1,000, which is slightly in excess of that returned for 1882.

BRAINTREE RURAL.—The third annual report of Mr. C. E. Abbott possesses the conspicuous merit of being written strictly on the lines of the official instructions. The circumstances of the district are such as to call for active and energetic supervision, and the report bears evidence of this having been bestowed. The system of excrement disposal at Coggeshall is in much need of improvement, which could best be effected by the adoption of the Health Officer's suggestion for the establishment of the Goux system of closets. The water supply for the most part is derived from shallow surface-wells, which are not fit receptacles for drinking-water. The necessity of securing an improved supply was demonstrated by the contamination of one of these wells by typhoid excreta. The year was characterised by a considerable prevalence of zymotic disease, some 140 cases being notified to the Health Officer. Scarletina, the continuation of the epidemic of 1882, was scarcely absent from the district at any time, and caused fifteen deaths. The disease was of a mild type, and the spread of infection was largely due to this and to the reckless exposure of children when in a state of desquamation. Diphtheria, also the revival of the outbreak of the previous year, was fatal in eight cases out of a total of twenty-eight, of which information was received. Mr. Abbott is inclined to attribute the principal part of the epidemic to school influence, though he admits that a more probable explanation is to be found in the extreme poverty, bad feeding,

and unhealthy conditions so prevalent in some parts of the district. Nine deaths were recorded from diarrhoea, and three from measles. Proper precautions were adopted to prevent the spread of these diseases, which in all numbered thirty-six, being equivalent to a death-rate of 1·75 per 1,000. The general death-rate is returned at 16·69 per 1,000.

CARLTON.—Mr. J. T. Knight reports that a larger number of private improvements were effected in 1883 than in the previous year, but he reminds his authority that much more might and ought to have been done, and he earnestly recommends a more vigorous exercise of the powers conferred upon them by the Public Health Act. Particular attention is drawn to the necessity of a supply of wholesome water, and to the fact that some parts of the district are deplorably in need of proper sewerage. On the whole, however, much has been done of late to improve the sanitary aspect of the district, and the report shows that the efforts of the sanitary authority are often seriously hampered by private interests. The mortality from all causes in 1883 was much less than in the previous year, and the zymotic deaths exhibited a decrease of 13. The fatality amongst infants, however, was extremely high, and chest affections contributed somewhat largely to the death-rate, which is estimated at 16·03 per 1,000.

CARNARVONSHIRE COMBINED DISTRICT.—The almost phenomenal prevalence of whooping-cough in this district during 1883 is naturally a subject to which Mr. Rees, in his annual report, devotes much attention. For the most part the disease, which caused 211 deaths, was spread by the ignorance and apathy of parents, and the absence of means for obtaining information of new cases. An effort was made to secure the compulsory notification of such cases, but without success; and, pending some satisfactory arrangement, Mr. Rees advocates the erection of infectious hospitals. It would appear, he observes, that this question is somewhat at a deadlock, from the different views regarding it held by the local and central authorities. The former hesitate to incur the expense of building hospitals without having prompt information of the first cases invading their districts, a condition which they look upon as essential to its usefulness, and the latter are reluctant to grant compulsory notification until the erection of a hospital has shown that there is a thoroughly earnest resolution to deal effectually with the cases when they have been notified. Mr. Rees inclines to the view that, even in the absence of hospitals, the notification of infectious disease is invaluable, though he admits that for realising its utmost advantages the provision of such accommodation is essentially necessary. Diphtheria and croup contributed largely to the mortality, the deaths numbering 73, whilst on the other hand the fatality from typhoid fever was much below the average. This last disease visited Bangor with remarkable leniency. Three cases only came under consideration during the first six months, and all recovered. When the enormous amount of infective matter that was diffused through the town in 1882 is taken into consideration, it appears little less than marvellous that the disease should have been stamped out so effectually. Mr. Rees attributes this to the thorough and constantly sustained disinfection, especially in keeping the sewers constantly filled with euehlorine gas. Measles and scarlatina were both prevalent in epidemic proportions, and together destroyed 137 lives. The death-rate from zymotic causes was as high as 3·14 per 1,000, the general death-rate being equivalent to 20·4 per 1,000.

FULHAM FEVER HOSPITAL.—In his seventh annual report on the working of the Western Hospital of the Metropolitan Asylums Board, Dr. R. D. R. Sweeting, the medical superintendent, states that including the patients remaining at the close of 1882, 273 patients were discharged cured, 21 died, leaving 43 still under treatment. Of the 236 admissions in 1883, as many as 197 (83 per cent. of the whole) were suffering from scarlet fever, 18 from enteric fever, 13 from typhus, and 8 from other

diseases. Besides these, six cases of scarlet fever developed eruptions of German measles in their course, the infection being started either directly from one of the cases admitted with the disease, or being due to the concurrent infection of one or more outside. Two cases, also, of chicken-pox co-existing with scarlet fever were noticed, one in which the eruption of the former was just showing, and in the other was in a more advanced stage; these cases infected a scarlet fever convalescent. Fifty-eight per cent. of the total admissions of scarlet fever were under ten years, whilst the second quinquenniad afforded the most cases. The deaths numbered 15, the mortality being greater amongst males than females, and heaviest in those under five years. Amongst the kidney affections noted by Dr. Sweeting as complications and sequelæ of this disease, acute inflammation and simple albuminuria held equal positions, being equal to a percentage of about 12 on the total of completed cases; dropsy was all but absent. Bronchitis and pleurisy were the most frequent amongst lung complications; the cervical glands the most frequently enlarged; purulent otorrhoea was fairly frequent; also purulent nasal catarrh. Uræmic convulsions were noted in eight cases, and a true relapse in ten. Acute rheumatism figured as a complication four times; and there were three cases of abscess behind the pharynx. Of those noted in enteric fever, which was fatal in three instances, and exclusively amongst males, bronchitis and pleurisy were the most common. There was no mortality amongst the patients suffering from typhus fever; indeed, as a matter of fact, five only were treated, the others being transferred. The average duration of stay of scarlet fever cases was 78·5 days, but this average was increased by the prolongation of stay of the patients who contracted measles. That of enteric fever cases was 72·2 days. Five of the nursing staff and one maid were attacked with scarlet fever, but none died: all were first attacks. An assistant nurse contracted typhus fever and died; two others caught measles and enteric fever respectively, and recovered. Dr. Sweeting's report, which maintains the high character of its predecessors for method and arrangement, concludes with a number of useful statistical tables, those recording the complications and sequelæ observed in completed cases of scarlatina and enteric fever being particularly interesting.

GLANFORD BRIGG RURAL.—The recent disclosures at Liverpool and elsewhere invest with a special interest the traffic in life insurance policies, and Mr. Moxon, in a report which evinces much care and thought, properly takes exception to the dangerous plan, extensively carried on in several villages in his district, of insuring the lives of infants and children. Zymotic diseases were fatal in 1882 to 65 persons, equal to a death-rate of 2·25 per 1,000. Mr. Moxon advocates the establishment of infectious hospitals in the more populous parts of his district, being convinced that many of the inhabitants would gladly take advantage of the opportunities thus afforded for the treatment of disorders of this kind. Diseases of the respiratory organs accounted for 65 deaths, a mortality considerably augmented by injudicious exposure. Passing over the principal social causes favouring consumption, over which a sanitary authority can exercise but little control, Mr. Moxon thinks that the stringent enforcement of by-laws having reference to the construction of better ventilated and drier houses ought in time to bear fruit. The general death-rate for the whole of the district represented 16·5 per 1,000. During 1883 the number of deaths from phthisis was 13 above the average. Mr. Moxon is unable to account for this excess, which he thinks may in part be an accidental circumstance, and he hopes that the present year may exhibit a corresponding decrease. This mortality was one of the causes of the increased death-rate, which was equivalent to 19·0 per 1,000. The fatality amongst infants and young children was below the average, but there was a large number of deaths recorded in aged persons. Zymotic diseases destroyed 81 lives, representing a death-rate of 2·8 per 1,000.

GLOUCESTER URBAN.—The sanitary authority of this town seems in no mood to carry out the important requirements of their district. The fault, however, does not lie with the health-officer, Mr. J. P. Wilton, who from year to year continues to remind them that there is much to be done. Speaking of the condition of the sewers he observes:—'In the report for 1877, I stated that the escape of gas through the ventilators was a cause of serious complaint. In my report for 1880 I spoke of the nuisance arising from this cause, and in my last report I again called attention to the subject. At the present time there has been but little abatement, and as the warm weather arrives I anticipate a renewal of the nuisance.' Mr. Wilton points out that where additional ventilators have been provided the results have always been satisfactory, and he urges his authority to largely adopt this plan. An appeal is also made for the provision of proper hospital accommodation, the present building being described as 'a second-hand, wooden structure, which is now becoming old, and is not perfectly weather-proof.' That an erection of this kind should be called upon to serve a population of nearly 40,000 inhabitants seems scarcely credible, and the town council will be incurring a grave responsibility if they continue to allow their district to remain unprovided with adequate means for treating cases of infectious sickness. Mr. Wilton has little of interest to say in regard to the mortality statistics, but he thinks that, with the exception of the continuance of the epidemic of scarlet fever, the health of the town has not been unsatisfactory. Chest affections contributed largely to the death-rate, which is estimated at 17·3 per 1,000.

HANLEY.—A large proportion of this report is taken up by Dr. Swift Walker with statistics to show that the increase in the general death-rate from 22·3 to 24·1 per 1,000 was entirely confined to children under five, and to adults having ages exceeding forty-five years. Of the 401 deaths of infants under twelve months, 91 arose from the various zymotic diseases (52 alone being attributed to diarrhoea), 32 from tubercular diseases, 74 from convulsions, 71 from diseases of the respiratory organs, 55 from atrophy and debility, and 31 were premature births. Comparing these numbers with those of the previous year, it is found that the deaths from zymotic causes, constitutional diseases, and atrophy and debility show an increase, whilst those from other causes exhibit a decline. From the principal zymotic disorders no fewer than 219 persons at all ages lost their lives, returning a death-rate of 4·4 per 1,000; and Dr. Walker thinks that 'considering we have been visited by three epidemics, it seems almost miraculous that the rate of mortality is not higher.' The outbreak of scarlet fever, fatal in 65 cases, seems to have caused considerable trouble; but the report contains little of interest in regard to this or the other epidemics. Some sanitary work of a practical and permanent character was performed during the year, although Dr. Walker's method of recording it is not of the best.

HELMSLEY RURAL.—In addition to enjoying a remarkable immunity from zymotic disease, the general death-rate of this district during 1883 (13·88 per 1,000) was much below the average of previous years. The mean death-rate recorded in the period 1863–1880 was 18·7, whilst the average of the last three years was only 15·2. Dr. Bruce Low estimates that this is equal to a saving of 14 lives per annum, which he attributes to the improved sanitary condition of the district. The rate of infantile mortality also participated in the decline, although the fact that four out of nine deaths under one year occurred in illegitimate children cannot be regarded as satisfactory. Scarlet fever was the only infectious disease which appeared in a fatal form, the deaths (three in number) being equivalent to a zymotic rate of 0·75 per 1,000. There were several local outbreaks of diarrhoea, due principally to insanitary surroundings; but not a single case of either diphtheria or enteric fever was heard of. Dr. Low is unable to chronicle the completion of any works of drainage or water-supply, and he points out that the machinery for

h outbreaks of infectious disease has practically ce in the district. He thinks, however, that ity are to be congratulated on the satisfactory e year's work, and hopes that the future may rovision of proper means for protecting and g the health of the inhabitants.

RURAL.—The most pressing requirement of tant mining district is a wholesome supply of ch, owing to the obstinacy of the local water the authority are unable to provide. Dr. Mac- ts out that the absence of this first essential of anliness was severely felt at Prudhoe, where a ber of cases of typhoid fever occurred either indirectly from this cause. The fact that no ts whereby the excellent drainage throughout of the district may be systematically flushed, y anticipation of these villages being placed in isfactory condition. The history of the circum- ending the prevalence of zymotic disease, which for 13·9 per cent. of the total deaths, as com- 7·2 in the previous year, clearly shows that e cases might have been prevented, had imme- nation of their occurrence been afforded to the icials. Unfortunately, however, no means exist any knowledge of the first appearance of in- ease can be given to the health-officer, at least can be in all cases depended upon. Dr. Mac- not repeat the many arguments in favour of notification, but he observes that until this has ded, the difficulty of dealing successfully with will be almost insuperable. There was a de- te rate of infantile mortality, and the uncertified e fewer than in 1882. Dr. MacLagan seems to cted no opportunity to improve the sanitary ie district, and his report contains much evidence and painstaking work.

DREST RURAL.—To judge from Mr. Jenkins' ort, the general sanitary condition of this district have materially improved during 1883. In the a no death has taken place from typhoid fever uthority appointed a Committee of Inspection, d upon the improvement of the drainage and ly. At Lyndhurst a committee was appointed ate the sanitary condition of the place, with the se the words of the medical officer himself, 'of rectifying the defects as far as is possible at It is also satisfactory to note that the inhabit- is place have appointed a burial board, and site for a burial ground. Some such committee ch sat at Lyndhurst is evidently wanted in the trict, where the death-rate is the highest in the l the water-supply and drainage are very det- at Hilltop every house was inspected, and all te sanitary improvements carried out. The or the year 1883 was 27·85, and the death-rate f zymotic diseases, measles proved by far the accounting for 13 deaths out of the 16 attributed disorders of its class. Of the 13 deaths from 2 occurred at a village named Eling, which close proximity to Southampton, where the s raging, and whence it was probably carried. er of deaths in children under 5—73 out of an of 211, or 5·5 per 1,000 population—was greater uld be. In Mr. Jenkins' opinion the cause is l, in a great measure, in the scarcity in many milk, and in the custom which prevails among giving their infants 'farinaceous or other unsuit-

HAM.—Based upon a population of 54,063 per- eath-rate of this district in 1882 represented 000 against 16·8 in 1881 and 16·5 in 1880. is increased mortality was due to the fatal pre- zymotic diseases, which accounted for 216 4 per 1,000 inhabitants, out of a total of 973 from all causes. Scarlet fever and whooping- e present in epidemic proportions, and together

destroyed 116 lives; while diphtheria, measles, and 'fever' claimed a larger death-rate than in the previous year. The very unsatisfactory state of the sewers, especially as regards flushing and ventilation, is an evil of great magnitude, and one that the authority should bestir themselves to remove. Referring to the need of an extension of the sewage works, Dr. Watson observes, 'I hope that the Board will liberally provide engine power, not only for the present increased requirements, but for the future, as I understand that the present engine and pumps are at times totally inadequate to lift the sewage, and at such times the sluice has to be opened to allow the crude sewage to pass off into the dock.' Both in this and in other directions the district stands in need of earnest and sustained attention at the hands of the authority, whose dilatory action cannot be excused on the plea of want of practical advice. During 1883 Dr. Watson reports that many unhealthy places have been greatly improved, although the state of the sewers is still very defective. There was a change for the better in the system of re-use removal, and, as regards the performance of minor sanitary work, Dr. Watson notes with satisfaction that owing to the readiness with which owners and occupiers of houses complied with the requisitions and notices served on them in respect to nuisances, it was unnecessary to take legal proceedings in any case. The general death-rate represented 16·1 per 1,000, being, with one exception, the lowest recorded since 1871. There was an extensive epidemic of measles which destroyed 41 lives, and the mortality from diphtheria was much above that registered in the two previous years, whilst on the other hand scarlatina, whooping-cough, and 'fever' were less fatal than usual. The zymotic death-rate was equivalent to 2·7 per 1,000.

SURVEYORS' AND SANITARY INSPECTORS' REPORTS.

BARROW-IN-FURNESS.—Mr. W. H. Fox, C.E., the surveyor and engineer of this borough, has written an excellent and practical report as to his proceedings during the year ended Aug. 31 last. Not the least interesting part of the report is that which is devoted to an account of the single and duplicate systems of sewerage at present in use. Referring generally to the question of drainage, Mr. Fox is convinced that every year brings additional evidence that sanitary matters are being better understood and appreciated, an increased anxiety being noted on the part of the inhabitants to have the drainage of their houses put in order. This is not always easy, for after the old drains have, it is believed, been taken up and relaid and properly disconnected from the house, there is still some defect, which is at length found to arise from an old field drain or a house drain abandoned some years previously, and which had not been properly cut off. Much attention is devoted to an account of the steps taken for improving the surface of back yards, and we quite agree with Mr. Fox in thinking that a paving of Macadam is to be preferred to the old and objectionable cobbles, which permit of the lodgment of filth in a manner that is difficult to remove. Proper regard was had to the regular and systematic flushing of the sewers, especially in the summer, and a sharp look out was kept on all new buildings. The removal of refuse was not neglected, and the surveyor records the mortality statistics of the borough since 1874 in order to emphasise the advantages of the water-closet and dry-ashpit system over the old-fashioned middens. The appendix contains an abundance of statistics of local importance, together with some useful maps and plans.

BEDFORD RURAL.—Mr. Adams reports that in 1883 he disposed of 270 nuisances, of which no fewer than 175 arose from accumulations of refuse and defective privies. Twelve houses were found to be dilapidated and unfit for

habitation, 11 were reported as overcrowded, and 20 were disinfected. In 39 cases defective drains and privies were remedied, and other minor improvements effected. Of the 270 nuisances inspected, 170 were abated without the issue of formal notice.

BOSMERE AND CLAYDON RURAL.—Mr. Harrington reports that during the past year 215 nuisances were reported, of which 192 were abated, involving the issue of 184 notices. No improvement was made in the water-supply of the district, with the exception of the closure of a polluted well; but 48 privies were repaired and otherwise improved, and 19 house-drains were trapped. Altogether 1,864 houses and premises were inspected, and a considerable number of nuisances of a kind incidental to a rural district were satisfactorily disposed of. In no case was it necessary to resort to legal proceedings.

BRIDGWATER.—The report prepared by Mr. G. B. Laffan on his work in this district during 1883 is one of the best that has come before us. It sets out in clear and concise language the steps taken for improving the water-supply, describes the effect of the various sanitary operations carried out during the year, refers to the operation of the Food and Drugs Act, and concludes with some excellent and practical suggestions. Thus, he points out that owing to the situation of many of the slaughter-houses, it is almost impossible to keep them in a proper condition; and recommends the erection of an abattoir, which would not only effectually rid the district of nuisances of this kind, but prevent the traffic in diseased meat. The importance of providing public baths is also pointed out, and the authority are reminded that this is a necessity for which all progressing towns are providing. The fact that out of 119 samples of well-water analysed during the year no fewer than 79 were condemned as unfit for drinking or domestic purposes points to the need of an extension of the public service, which is being carried out. It not unfrequently happened, however, that the inhabitants refused to avail themselves of this supply when provided for them. A house-to-house visitation revealed the existence of so many grave defects, notably in the dwellings of the poor, that the inspector suggests to the authority the advisability of appointing an additional officer to assist in the work.

CHESTER.—A large amount of practical work seems to have been accomplished in this district during 1883, although Mr. Wharton, the sanitary inspector, has been content to record it in the form of a statement. In regard to structural alteration in the drainage of houses, and in the management of the scavenging department, the health-officer thinks that much credit is due to Mr. Wharton for his energy and tact. As to the latter he has succeeded in reducing what was at one time an annual deficit of 300*l.* to a balance on the right side, and at the same time he has got rid of the depôts which were an expense and a nuisance. As many as 1,407 notices were issued for the performance of various works in dwelling-houses, &c., but with what result does not appear. Forty-eight houses were disinfected, and 466 were cleansed, repaired, and limewashed; 230 drains were trapped or ventilated, and 43 privies were converted into water-closets. The total number of premises, &c., inspected during the year amounted to 6,030.

DUNMOW RURAL.—After recording, in chronological order, the legal proceedings taken in 1883 for the enforcement of necessary sanitary requirements, Mr. J. Hamilton proceeds to summarise the number and nature of the nuisances abated by him during the year under notice. Although but few structural works were undertaken by the authority, the district seems to have been kept under constant supervision. Of the 226 nuisances disposed of by Mr. Hamilton, 70 arose from foul privies, urinals, and cesspools, 30 from imperfect drains, 10 from want of proper privy accommodation, and 60 from accumulations of refuse. Three houses were found to be in an over-

crowded state, two were condemned as unfit for habitation, and 60 were disinfected after the existence of infectious disease.

EPHING RURAL.—A large amount of miscellaneous sanitary work was performed in this district during the year, although Mr. Bell does not make the most of it in his report. He states that he made 936 inspections, issued 300 letters, and issued 71 notices to new houses under the Public Health (Water) Act. There were 255 served during the year, of which 47 were to improve the water supply, 60 to connect the house drains with the main sewer, 50 to open, cleanse, or reconstruct drains, 10 to empty cesspools, 43 to provide stretch traps and 10 to disconnect sink pipes, and 41 to remove obstructions of refuse. Mr. Bell does not, however, refer to the result of the issue of these notices. Fifteen samples of well water were submitted for analysis, and 13 were connected with the sewers.

HACKNEY.—The report which Mr. J. Lovegrove, chief surveyor, sends us of his work in this borough for the year is a model of its kind, and has been prepared with much care. In addition to recording the more important items of sanitary progress, so far as concerns this borough, Mr. Lovegrove goes into the question of expense, and compares the cost of the principal works in one year with others, and in cases where striking differences are shown proceeds to explain how they arose. The report contains the surveyor's views on the principal bills of the year, the Thames Crossings Bill, and other matters of interest to the Vestry. Some idea of the works devolved on the sanitary officials of Metropolitan areas may be gathered from the fact that in 1883 as much as 5,082*l.* was expended in watering the Hackney district, and 10,000*l.* in new paving works. The street-lighting cost 8,932*l.* as compared with 11,758*l.* in 1882, notwithstanding that 541 additional lamps had been erected. Considerable progress was made in the improvement of the sewers, re-numbering houses, and re-naming streets, and in effecting other structural improvements.

HANLEY.—Mr. Lewis's report is in the form of a tabular statement, but it contains a record of some of the unimportant work. No fewer than 14,450 houses and shops were visited, with the result that 484 notices were issued for the remedying of defects or the removal of nuisances. Twelve new water-closets were provided, 220 pans were placed in old ones; 139 house drains were repaired and cleansed, and 103 sink pipes were re-nected. An immense number of houses were washed, 148 defective spouts were repaired, 83 bins were provided, and 16 were covered or altered for the better. As many as 660 complaints of the non-removal of dust were received and attended to, and 29 accumulations of refuse were disposed of. That seven convictions were obtained for selling food in milk points to the need of an active administrative provision of the Food and Drugs Act.

HASTINGS.—Some really important work seems to have been performed by Mr. Inskipp during 1883, but his report, in regard to the drainage of the town, he states that 14 of main traps fixed, air shafts and other sanitary improvements carried out by the inspector's suggestions, and that the result was much too brief to be satisfactory. In regard to domestic sanitation, Mr. Inskipp reports that 85 houses were inspected, that 12 were provided with new drains, 10 were provided with new drains and lime, and that 70 were fumigated. Seventy-six drains were repaired, and 16 new closets were built; 50 accumulations of refuse were removed, and three smoke nuisances were abated. Some 96 sets of bedding and clothing were disinfected by the authority, to whose hospital 48 infectious diseases were removed. Thirty-five sets of food, &c., were collected for analysis, and a considerable amount of fish was destroyed as unfit for human consumption.

RURAL.—The details of the work completed by Thompson in this district indicates that the insanitary conditions received prompt attention. His reports that out of the 129 nuisances notified in 1882, 106 were satisfactorily abated. The major nuisances arose from foul ashpits and offensive accumulations, whilst in several instances drainage or water-supply was at fault. A number of houses were reported as dilapidated and unfit for habitation, but Mr. Thompson does not record the action taken by the authority in reference thereto, nor explain why, in the case of two uninhabitable houses at Walwick, the proper legal notice was not

NORTON RURAL.—1. Mr. R. Godfrey, the sanitary authority for this district, has prepared a useful and practical report on the work that has been performed since the date of his last report in June 1882. It sets out in a concise manner the improvements that have been made in ventilating the sewers, the removal of refuse, &c., and gives particulars of the various structural works that have been completed. In connection with sewerage Mr. Godfrey thinks that there is often a local nuisance at a particular manhole causes complaint, and it is not a condemnation of a whole system of sewers because of one or two points. During the period of the year an automatic flushing-tank and a number of cesspools were provided. The removal of refuse, which was formerly left to householders, has been taken over by the sanitary authority, with very satisfactory results. As to a subject immediately connected with health, the use of means for the extinction of fire is one of the provisions of the Public Health Act has, in certain circumstances, been under the control of local sanitary authorities; and in this instance Mr. Godfrey points out the very means which his district possesses in this respect. The report is enhanced by the addition of an appendix containing a list of houses for which plans have been made, an inventory, and other useful statistics. The improvement in the scavenging of this district during the last year by the sanitary authority themselves for the regular removal of house refuse without the aid of the inhabitants. Mr. Clarke, the inspector, reports that since July 1883, 434 ashpits have been closed and the refuse removed from one part of the district. The number of nuisances dealt with during the year amounted to 458, no fewer than 119 arising from ashpits, and 108 from defective drains. Twenty-five gallons of water were found to be unwholesome, and samples obtained from wells and submitted for analysis. Fourteen were found bad and unfit for drinking, and four were pronounced as fair, and but two as being so bad as to cause twenty-one persons suffering from scarlet-fever, and from small-pox, were removed to hospital, and the houses were fumigated after the prevalence of infectious disease. Mr. Clarke briefly summarizes the contents of twenty-three special reports prepared during the last year, and thinks that the statistics compare favourably with any other district of the county.

DRON-UPON-HULL.—A curious example of the appreciation on the part of the public of the value of measures in their outward and visible form is given by Mr. J. Osborne, the sanitary inspector of this district in his last report. Speaking of the active manner in which disinfection was carried out in 1883, no fewer than 50 gallons of fluid having been poured down the streets, courts, and alleys of the town, and that the men engaged on the work were given the fluid to every one who applied for it, and with their own buckets. This was much appreciated by the public, especially in the crowded and polluted districts, and, the inspector adds, it was a sight to see crowds of women and children with carts, with buckets for a supply for the gullies in back yards. But what was done with these

buckets of fluid, and did they effect any real good? An important change for the better was the alteration of the system of night-soil collection, by which the borough was divided into districts, and the contractor required to call at a certain number of houses each morning. In addition to the performance of much miscellaneous work, Mr. Osborne reports that 8,834 feet of sanitary pipe drainage were fixed, that 775 gullies were provided, and that in 309 houses the drains were either laid or relaid. The constant and systematic inspection of the common lodging-houses and other licensed buildings led to much improvement, and a rigid examination of the food supplies of the borough revealed much that was unwholesome and unfit for consumption. Mr. Osborne reports that the refuse-destructor proved of immense utility during the year, but he strongly recommends that instead of being used for road making, the residue should be made into mortar, for which it seems particularly adapted.

LIMEHOUSE.—The circumstances of this portion of the metropolis are such as to call for systematic and sustained work, and Messrs. Hurlock and Stace, in their last annual report, show that this has been bestowed on the district. House drainage in particular received special attention, no fewer than 215 drains being trapped or ventilated, whilst 146 were repaired and cleansed, 172 privies and closets were altered for the better, and 9 were supplied with water. As many as 2,950 complaints as to dust removal were received and satisfactorily disposed of, and various offensive accumulations of refuse were swept away. The covering of cisterns was actively carried on, and a number of new ones were erected. Altogether 2,425 houses were inspected, and 2,075 orders issued for the abatement of nuisances and the execution of various sanitary improvements. The inspectors report that in 195 cases information was afforded to the school authorities of the occurrence of infectious disease, and that 210 houses were disinfected. The bakehouses and slaughter-houses were regularly inspected, and two nuisances discovered at a factory were abated.

NANTWICH RURAL.—Mr. J. A. Davenport has written an excellent report on his work in this district as surveyor and engineer. After recording the results of a systematic inspection, and the number and nature of the nuisances abated during 1883, he proceeds to deal with more important subjects. The value of a supply of wholesome water is clearly shown by the marked increase that has taken place in the erection of new buildings, 132 plans having been passed last year as compared with 69 in 1882. Builders have assured Mr. Davenport that they would not have purchased land and erected dwellings had it not been for the public supply of water, and he thinks, therefore, that the sanitary authority may fairly claim to have contributed to the material prosperity of their district. Proper regard was had to the inspecting and certifying of houses under the Public Health (Water) Act, and numerous samples of water were collected and forwarded for analysis to the medical officer of health. The usual inspections were made in connection with outbreaks of infectious disease, and the slaughter-houses were subjected to a close supervision. From every point of view Mr. Davenport seems to have performed much good work, and his manner of reporting it deserves a special word of praise.

ST. GEORGE, HANOVER SQUARE.—Mr. Snooks' report, although in a tabular form, bears testimony to the performance of much useful work. Considerable progress was made during 1883 in improving the drainage of the district. Thus, 24 old brick drains were abolished, glazed stoneware-pipes being substituted, six new drains were constructed, and a number of sinks were trapped and disconnected. Twenty-four closets were supplied with water, 32 were unstopped and repaired, and 27 cisterns were covered. The other items in the report refer to the cleansing and limewhiting of houses, the removal of refuse, and the provision of dust-bins, &c. Numerous visits were paid to infected premises, and, as usual, an enormous

number of articles of bedding and clothing were disinfected. The erection of one of Dr. Ransom's chambers was an important addition to the sanitary organisation of the district.

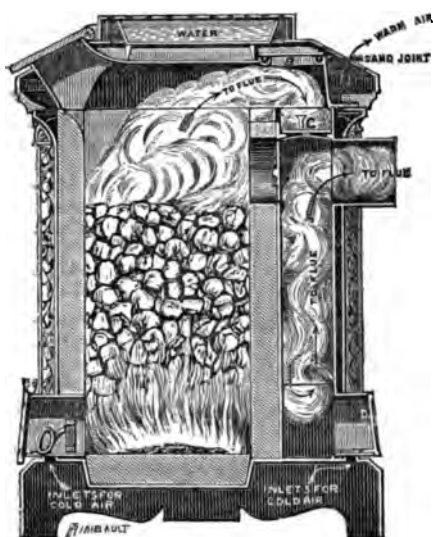
NEW INVENTIONS.

NEW IMPROVED SLOW-COMBUSTION HOT-AIR STOVE.

MESSRS. STEVEN BROTHERS, of Upper Thames Street, London, and the Milton Iron Works, Glasgow, have recently introduced a new stove of the slow-combustion class, of an economical character, with attractive appearance, and possessing other commendable characteristics. Drawings in section and elevation are appended, by the inspection of which its arrangements will be fully understood. The interior of the stove is lined with thick fire-clay; and the



outer surface is of ornamental cast-iron, formed into a series of hollow columns, which greatly increase the initial heating surface. The heated air, first admitted

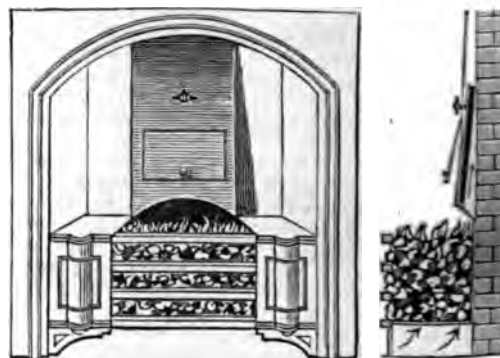


cold from the bottom, passes up these columns and out through the perforated top; the central portion of which

is formed into a reservoir for water for moistening the atmosphere if considered necessary. The well-known qualities of fire-clay in reference to the accumulation of heat, and its subsequent slow and continuous radiation, have here good practical opportunities and a genial warmth is the result, without the unpleasant smell that invariably accompanies a highly heated stove composed of iron only. There are two entrances to the flue—the one direct, but only necessary to be opened when the fire is first lighted for the purpose of drawing it up rapidly, after which this communication is closed by simply turning a handle in connection with a valve or damper, the access being then obtained by the heat passing down side flues, up the middle, and so to the main one. By this means the heat is nearly all extracted before it enters the chimney. The flues are easily accessible for cleaning out, and no difficulty should ever arise on this point. Any kind of fuel will burn in this stove, and if coke be used it becomes smokeless. It is calculated that the heating power of the smallest sized stove—31½ inches high by 17 by 21 inches base—is sufficient for a room of 10,000 cubic feet. The general appearance and construction of this stove are of a satisfactory and ornamental character.

STOBBS'S PATENT SMOKE PREVENTOR.

IN our EXHIBITION RECORD of Sept. 15, we alluded to the Patent Smoke Preventor, the invention of Mr. Wm. Stobbs, since which a medal and certificate has been awarded it, and a company formed for developing it, whose offices are at 16 Duke Street, Grosvenor Square. The object of the invention is to prevent smoky chimneys, and to supply an apparatus that can be affixed to any existing grate as an independent appliance to promote combustion, and reduce the amount of smoke generated by bituminous coal. To accomplish this Mr. Stobbs introduces a kind of hood, so formed that it shall not be an unsightly appendage, that performs the double duty above mentioned, and in outward appearance is not unlike the common draught-plate in use in the Midland counties for drawing up the fire when dull, and that is to be seen in almost every house in those localities. It is only fair, however, to Mr. Stobbs to say that if he took his idea from this simple appliance, he has developed a commonplace article into a somewhat scientific apparatus, changing a fire to a quick draught, or slow-combustion principle, and at the same time arresting a considerable portion of the heat that usually passes up the chimney, and minimising smoke. At the tests taken at South Kensington, under the superintendence of Mr. D. Kinnear Clarke, the testing engineer of the Smoke Abatement Institution, the smoke shade



of this appliance was very low, registering in the main between 'one and two' of the published colours of density of the Smoke Abatement Institution, which is almost as slight as it could be. The appended illustration shows the appliance resting on a hob-grate.

Where used for one without those additions it is hung from the upper part. Inside the hood is a swinging diaphragm, with a series of gills at the back, forming mixing chambers for the products of combustion; and this diaphragm is pressed forwards or backwards by means of the top knob shown in the illustration, by which means the draught is increased or diminished. The interior of the hood is necessarily filled with hot air, and into it all the products of combustion pass when they undergo a certain amount of distillation, and are rendered partially innocuous before they enter the chimney. Approval of this invention is based on these heads—viz.: That it is entirely independent of the fire-basket or grate itself, thus obviating the necessity of altering the grate, and from the absence of additional flues often difficult to keep clean; that it can be removed at pleasure for keeping the inner parts clean; that it is likely to prove an effectual cure for smoky chimneys, and, as shown, it reduces the amount of smoke to a minimum. This stove appears to burn any kind of fuel with equal facility, and particularly anthracite; and, as an appliance to attach to existing grates to effect the reduction of smoke, may be confidently recommended.

PATENT CAST-IRON INSPECTION OR ACCESS PIPES FOR HOUSE-DRAINS.

THIS pipe, of which an illustration is appended, is the invention of Mr. G. C. Davies, Lausanne Road, S.E., and is intended by the patentee to take the place of the modern inspection-chambers. The invention consists of the ordinary circular cast-iron pipe, open a sufficient distance of its length and upper circumference for all purposes of inspection, insertion of cleansing-rods, and so forth. The lid or cover for this opening is so formed that when fixed in position the interior of the pipe is perfectly sound and clear, the grooves necessary to effect a seal being on the outside. The cement used for making the joint is principally white lead, and this, while making it perfectly gas-tight, does not harden to any extent in use as to interfere with the removal of the cover when inspection is needed. The cover is also screwed down by the aid of gun-metal screws, rendering it doubly secure. It will be observed that as the interior of the inspection-pipe is secured against the admission of any of the surplusment used in making the joint, no accumulation of cess can take place, neither can the joint be broken by heavy flushing owing to the presence of the gun-metal screws.



Fig. 1 is a plan showing the under side of the cover over the inspection aperture, A being the curved soffit forming a section of the inside periphery of the pipe; B shows the position of the gun-metal screws, for securing the cover to the pipe; D is the groove for receiving the stuffing material for making the gas-tight joint.



Fig. 2 is a plan of the pipe with the cover off, showing the aperture for access, A; B being the tongue running round the aperture corresponding to the groove D, in the cover.

There are several advantages claimed for this invention, and they appear in the main to be well-founded. Economy and simplicity are two, as the presence of manholes and open channels is dispensed with, and the foul gas area of

the drain is reduced to the minimum. The effectual flushing of the drain is secured, and the cleansing rods can be worked with ease. The benching up of the sides of the manhole chamber, and the expense of an air-tight door on the top is obviated, the ventilating pipe necessary to the open inspection chamber is not required, and a stone, common iron door, or grating is all that is necessary. Cast-iron pipes are not likely to be damaged as stoneware ones, and the patent inspection pipe being made of the same sizes as stoneware drain-pipes, can be used with them, so that disturbance of the other pipes is not neces-

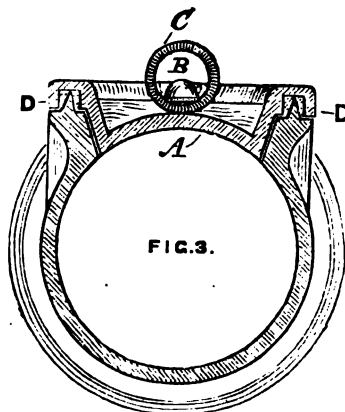


Fig. 3 is a transverse section enlarged scale through the centre of pipe A, showing the inside of the cover when fixed in position on the pipe; B the gun-metal screw; C, the eye at each end for lifting the cover; D the groove and tongue gas-tight joint running round the inspection aperture.

sary. The superiority of cast-iron over stoneware pipes for house drains is now an admitted fact, though, perhaps, somewhat tardily admitted. There is no doubt that Mr. Davies's inspection pipes supply a want in connection with the system of drainage, and possess several points of interest to those engaged in the laying of drains generally.

DISINFECTING CANDLES.

YOUNG's Paraffin Light and Mineral Oil Company, the head offices of which are at 30 George Square, Glasgow, may be complimented on the success they have secured by the introduction of their disinfecting candles, which in appearance are sufficiently elegant for the drawing-room, whilst their cost does not preclude their use by the general public. The light given by these candles is as good as in the highest standard candles; and by the incorporation in their manufacture of carbolic acid and similar substances, an aromatic odour is given off wherever they are burnt. Although more particularly intended for sick rooms, or where contagious disease exists, these candles may be used under all circumstances, without any disagreeable accompaniment of disinfectant odours.

CEYLON TEAS.

It may not have been generally known until the 'Healtheries' popularised the fact, that really fine tea is grown in the island of Ceylon, many of the planters having transferred their attention to the cultivation of tea in preference to coffee. The public are indebted to a late governor of the island, Sir William Gregory, and a few gentlemen connected with the Ceylon trade, for the opportunity now afforded them of obtaining the tea in a pure state, a Ceylon Tea and Coffee Agency having been established by Messrs. Wolstencroft and Foster, Imperial Arcade, Ludgate Circus. These teas vary in price from two to three shillings per pound; the three-shilling tea has a very fine flavour, somewhat akin to the Indian teas, though in the opinion of the writer more likely to please the English palate. These teas are, like those of

Indian growth, different in flavour from the Chinese kinds, and require a little 'education' of palate or 'acquired taste' to render them popular. A very short acquaintance will, however, in the judgment of the writer secure this requisite, and if people would pay a little more attention in the infusion of the tea-leaf generally, they would secure a much more aromatic beverage. The Ceylon tea sold at 3d. per cup at the Health Exhibition was extremely good, and was of the same quality leaf as now sold by this agency. Besides teas, Messrs. Wolstencroft & Forster sell pure Ceylon Cocoa in powder, from which a quantity of the superfluous oil has been extracted—a concentrated preparation which will compare favourably with the finest to be obtained. Ceylon Coffee is also imported by this company, and sold either in the berry or ground. Reverting again to the teas, those families whose consumption of tea or means enables them to purchase in original packages of 'caddy,' half-chest, or chest, will have a considerable reduction made to them, whilst they will have the patriotic consciousness that they are helping to foster one of the important industries of our own possessions.

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Sanitary Drainage of Tenement Houses. Hartford, Conn. 1884.

Hints on the Drainage and Sewerage of Dwellings. New York. 1884.

ONE rises from the perusal of such works as these with feelings of candid admiration, and it would be difficult to imagine a series of publications—which are all by the same author—without acknowledging that sanitary science is deeply indebted to him for the systematic manner in which he has probed its depths and measured its influence. The works before us exhibit a complete familiarity with the sanitation of which he treats, the drift of which will be easily seen by the mention of his works. We do not think that the matter of scientific sanitation has been treated in any country outside of England, France, or Germany in a more comprehensive manner, and when we consider that our author has—over and above the exigencies of his own climate—dealt with the broad question, we acknowledge he has done so in a manner worthy of commendation. It would be needless and useless to discriminate between the contents of the four publications now before us, for they are simply compacted of reason and experience, and must commend themselves to all reasonable minds. The only way to ascertain the value of these works is to read them; for although the leading matter of each is germane, and slightly identical, there are points in each publication, which require a special attention on the part of a careful reader.

The author may safely associate his claim as a teacher of sanitary science with the production of his last-mentioned work, because in it will be found nearly everything which an ordinary sanitary practitioner, clerk of works, or inspector might be fairly asked to command from his points of knowledge. We may even say more than this, and aver that not only the humbler and necessarily less penetrating students will find pabulum for the mind in these pages, but the more abstruse and inquiring minds will find much to gratify, satisfy, and recollect.

Taking the last volume of Mr. Gerhard's, we are first of all struck with its table of contents, for it apparently ranges over the whole subject of sanitary science as applied to house building. The results due to sewer-gas, caused by defective plumbing—of which Mr. Ernest Hart and others have been discoursing in most serious manner—will be

found to have here a place. The defects of the soil and waste-pipe system are set forth in a very succinct manner and we are pleased to see that unventilated soil-pipes are properly treated. As regards traps—technically so-called—our author is very sound, and when he treats of the security of the water-seal, with its possible evaporation at syphonage, he must be credited with a thorough knowledge of these everlasting drawbacks to a house, and especially a house in which there is a perpendicular tier closets. In respect of the pattern of closets, he may be taken as an authority, and we say this because we can see that he is in concord with all the best authorities. We are gratified to find that our author—after commensurate study of the question—has approved of the system of employing rigid cast-iron piping, and we are especially gratified to find that the fresh air inlet system with its corresponding outlet delivery—whereby a constant current of air is maintained in the drains—has not been neglected.

Works upon drainage of all descriptions must, as a matter of course, more or less repeat themselves, and we will not seek, on principle, to follow our author into all the worried details of pipes, bends, and junctions, but we may safely advise our many readers that this and other cognate subjects are comprehensively treated in special pages. We especially recommend our readers, when dealing with the last-mentioned work, to carefully study the chapter which deals with the removal and disposal of household wastes.

Our space forbids us to mention at greater length any list of the subjects which are treated in these four volumes by our author, and, although we must admit that much of the material contained therein is concretionary in its character, Mr. Gerhard's works will benefit the rising generation, especially in America.

The Report on the 'London Water Supply' for the Year 1883. By Mr. W. CROOKES, F.R.S., and Drs. ODLING and TIDY. London: Wertheimer, Lea, & Co.

THIS report contains much interesting matter—very much that is especially interesting to chemists in the way of novel methods of analysis and of reporting the results thereof, and a great deal also which ought to be considered of universal interest and importance, particularly at the present time. In this latter category, as it seems to us, falls the discussion of the learned authors upon the practical importance of the dissolved organic matter in water.

In the first place, the fallacy of attempting to fix a common standard of comparison for river waters and well waters is clearly and emphatically demonstrated. Without attempting to explain completely the fact that river waters invariably contain more dissolved organic matter than the water of wells, unless the latter are directly contaminated by some gross supply of excrementitious matter, it is in all events easy to assign some reasons for the essential difference between them. Consider, for example, the more abundant population—if we may use the term—the waters of rivers. If undefiled by human agencies such as waste from mills, manufactories, &c., the waters of rivers teem with fish and infinite varieties of infusorial forms of aquatic living beings. We know of no living beings whose tissues are not liable to undergo changes of composition by oxidation, &c.; these changes must inevitably result in the production of waste matters, which being worse than useless to the living being, are cast into the surrounding medium. These excrementitious matters are, of course, to a large extent organic—that is to say, they are compounds of carbon, nitrogen, hydrogen, and oxygen, and many of them yield 'albuminoid ammonia' when the water containing them is boiled with a mixture of caustic potash and permanganate of potash. The water of wells is, of course, not devoid altogether of animal life, but such waters are not adapted to the life of fish and the higher forms of aquatic animals, which require large

runs for the exercise of their organs of locomotion, and even in some cases the possibility of a periodical visit to the ocean. And surely these higher (and considerably larger) forms of aquatic existence must produce larger quantities of organic *débris*.

Granted that rivers are more liable to receive the organic matters washed by rain off the soil in the neighbourhood of their banks than the waters of deep wells; still, if there be anything in the view that organic matters undergo oxidation by contact with water holding air in solution, a view which is now practically adopted by all chemists, little of this can reach the river in an unaltered condition, except in the case of very violent and continued floods, when the water of the river does usually suffer to some extent as regards its degree of purity from organic matter, and even then the incompleteness of the process of oxidation during percolation through the soil is to a large extent compensated for by the enormous dilution which the organic matters receive by the purest natural form of water—the rain itself. In fact, the question of the advisability of drinking the water of any river resolves itself into a consideration rather of the *source* of the dissolved organic matter than of its actual quantity. Let us quote from the official report:—

‘Whether or not variations—it may be relatively large, but always falling within the limit of a very small absolute quantity per gallon—are matters of any real significance must obviously depend on the character of the dissolved organic matter present, &c.’

Who would be afraid of being infected with cholera by imbibing in a glass of water a small fraction of a grain of organic excrement derived from a healthy salmon or trout? Nature surely intended the waters of rivers to be used by man for drinking purposes, and obviously tends to keep them pure and fit for that object by numerous and never-ceasing processes, such as the respiration of aquatic plants, oxidation, &c. But the most fearful scourges of mankind proceed from members of his own race. Human excrement must not be allowed to enter our rivers, at all events above the sources from which the water supply of towns is drawn. And, however cheering may be the reports of accomplished chemists as to the nature of the water supply of London, Londoners cannot feel perfectly happy on this subject so long as they know that the towns of Henley and Staines are still to some extent drained into the river, and that numerous house-boats are still permitted to defile the stream along its whole navigable course. We are glad, however, to learn from Sir Francis Bolton’s report, dated June 1884, that the contributions from Henley and Staines are to be arrested, though we see no mention therein of the house-boat nuisance.

We feel sure that the perusal of the Report on the Metropolitan Water Supply will inspire our countrymen with confidence and tend to prevent the occurrence of that state of mind, most disastrous at all times but more particularly in periods of real or threatened epidemics, known as panic.

Healthy Schools. By CHARLES E. PAGET. (International Health Exhibition Handbooks.) London: William Clowes & Sons.

THE questions of school hygiene are so various, so hotly contested, and so beset with practical difficulties, that nothing short of a wide and personal acquaintance with the circumstances, arrangements, and management of schools can enable anyone to discuss them satisfactorily. We would even go further, and venture an opinion that the work should have been committed to two men—one a medical member of a board of public elementary school managers, and the other medical officer to a high—i.e. a large boarding school. Though entertaining a high opinion of the abilities and promise of the author, we are at a loss to conceive why the preparation of such a handbook should have been entrusted to him, since, beyond having been a ‘public schoolboy,’ he has certainly had no

opportunities of acquiring the special knowledge demanded. The book is pleasantly written, but, as might be expected, contains nothing new or striking. It is a mere compilation, but a writer who cannot speak with the authority derived from personal experience might have given us a larger mass of facts and figures from other sources—as from the educational systems of France, Germany, and America, from which we may learn much both by way of example and of warning.

Mr. Paget very properly insists on the grossly defective air-space, and ventilation of elementary schools, but does not seem to be aware that what he rightly calls ‘the terribly low allowance of 120 cubic feet’ per child is the comparatively liberal allowance of the London and other School Boards, the amount prescribed by Section 96 of the Code being only 80!

On everything connected with schools for the upper classes the book leaves little to be desired, though to the description of the sanatorium devised by the author, and exhibited in the School Section of the Exhibition, a code of regulations for the management of outbreaks of infectious diseases, such as those so clearly expounded by Dr. Alder Smith at the Conference on School Hygiene, might well have been added. But from Mr. Paget’s want of personal acquaintance with the working of the Education Act and Code, we look in vain for any attempt to grapple with the greater and vexed questions of the relations between the health of poor children and school work, the medical aspects of the pupil-teacher system, and the management of epidemics among the children in attendance. Nor is there a hint as to the medical inspection of schools, a question which is attracting the notice of hygienists and educationalists at home and abroad, and which, if fairly carried out, would go far towards the solution of the rest.

Water and Water Supplies and Unfermented Beverages.

By JOHN ATTFIELD, Ph.D., F.R.S., &c. International Health Exhibition Handbooks. London: William Clowes & Sons.

WE have read with much pleasure and profit Dr. Attfield’s admirable handbook, in which he has condensed within the small compass of little more than 100 pages all that a layman needs to know concerning that most important compound, water.

Whilst the handbook may be recommended to the uninitiated and the general public as embodying the soundest teaching which the science of our day can give, the scientific reader will find much to admire therein, from the courageous manner in which the author advocates cremation, knowing it to be opposed to what he truly calls ‘a misguided sentiment, an ill-guided superstition, or simple ignorance,’ which are all lamentably prevalent, to the masterly way in which he expounds the intricate and difficult problem of the contamination of water with organic impurities, so that he who runs may read.

In treating of the properties of water, the author first enunciates briefly but accurately the ascertained scientific facts concerning any given physical or chemical characteristic, and then gives illustrations of practical effects of such property or behaviour of water upon the grand phenomena of nature, or the utility of the compound to mankind. In describing the varieties of water from different natural sources, the reader becomes familiarised, not only with the nature and sources of the substances found in solution in such waters, but also with the *modus operandi* of the grand processes by which natural waters undergo purification from what might otherwise be injurious ingredients: and is thus prepared to understand the chapter on ‘Water Purification,’ in which it is seen that the same processes are employed by man for the same purposes. In short the human artist in this, as in all other branches of industry, should sign himself, in all humility, ‘a long way after Nature.’

The fourth section of the handbook contains some valu-

able and interesting information on the subjects of tea, coffee, cocoa, and milk.

In the interests of humanity and of sanitary science, we hope that Dr. Attfield's work will be widely distributed and diligently read.

Sanitary Questions. By WM. PAUL GERHARD, C.E. Hartford, Conn., U.S.A., 1884.

WE know that America is well advanced in sanitary proceedings, and this pamphlet, which hails from the other side of the water, is a *résumé* of the views to which we are well accustomed here. It is reprinted from 'Cottages, or Hints on Economical Buildings,' but economy and perfect sanitation can scarcely go hand in hand, and some of the suggestions made are of a very expensive nature. For instance, referring to *ground air*, which has a tendency to rise into the dwelling, especially in winter, owing to the warmth of the building, it is advised that if there be no cellar, the dwelling should never be placed immediately on the ground, but must be raised on piers, arches, or posts sufficiently to allow of a large air space and perfect circulation between the surface and the floor beams. This will at the same time prevent the quick rotting of the joists and floor boards. To prevent the rapid cooling of the basement floor this should be laid double with an intermediate space filled with a non-conducting material, such as mineral wool. To adopt a process of this sort of course means a considerable addition of depth of space and material, and these are points which are ruthlessly cut down when the estimates are found to be higher than expected, and these high estimates are the experience of those who indulge in the luxury of bricks and mortar. Our Metropolitan Building Act insists upon the whole area of the building being covered with a 6-inch layer of concrete, but we are here advised to supplement this with a quarter inch layer of hot asphalt, and on top of this a finish of Portland cement. This is indeed making assurance doubly sure, but it must be paid for, and for small buildings these luxuries would debar any reasonable pecuniary return upon the outlay. Among the damp-courses mentioned are slates bedded in cement, and layers of tarred roofing-paper; both of these are certainly cheap, but they are comparatively ineffective; experience in England goes to prove that tarred felt in a position like this is very apt to rot. Asphalt, of course, is recommended, and rightly so, as it is one of the best known substances to prevent damp from rising. The water-supply of cottages is next mentioned, and the why and wherefore of the different sources and means of distribution are fully capitulated, and attention is drawn to the use of drawn seamless brass tubes, which are used for hot-water pipes in some of the Eastern States. The only advantage over lead would seem to be their neater appearance and less liability to sag, although changes of temperature affect brass pipes by expansion and contraction, causing leaky joints. Such pipes, if used for drinking water, should be tinned on the inside, but then again the question of expense would preclude the general use, the more so that the advantages of the more expensive material are, to say the least, problematic. A useful suggestion is recommended, even in the smallest buildings, to have a plan showing the exact size, material, and location of all water-pipes, stopcocks, faucets, cisterns, &c. This would often facilitate an inspection if required, but unfortunately a completeness of this description usually falls upon deaf or unwilling ears. Some elaborate, yet sensible and practical remarks, upon household wastes and sewerage are given, and earth-closets and plumbing fixtures are summarised for and against, and are likely to be useful to the uninitiated who may be willing to learn. The system of sub-surface irrigation is adverted to—*e.g.* to place a series of common 2-inch drain tiles in parallel lines about 10 inches below the surface of the ground, and distributing the sewage water intermittently through such a network of pipes into the ground, where it is acted upon by the vegetation, and purified by the earth acting as a filter. This system is explained as being also practical when water-closets are

used inside the house; but in this case the solids should be intercepted in a small receiving reservoir, which must be frequently cleaned, otherwise the distributing tiles will speedily choke and create a nuisance by ceasing to work. This brings to mind the principle advocated elsewhere in America of binding loose joints of drain-pipes with muslin bands, by which means the sub-surface water may be strained through the muslin and the sand, and other matter kept back. This seems to be a delicate treatment of a rough subject, and almost an ultra-refinement, as any uneven settlement of the pipes would give the muslin but a poor chance of withstanding the strain; and the question would also arise as to the length of time that such a flimsy material would effectually serve its purpose on its own merits. Although not mentioned in the pamphlet, the idea is probably known to the author, and any experience or views on the subject would have been useful.

The principles of warming and ventilation which are carried out so systematically in the new country are likewise discussed, and the difference is noted in the adequate performance of the work of open fireplaces under varying conditions; and it is agreed that an open fireplace which may be effectual in warm climates, is entirely inadequate to warm *per se* cottages in the Eastern, Northern, and North-Western States. Close stoves are naturally enough condemned, inasmuch as ordinarily arranged they make the worst possible devices for warming the air, for they remove practically none of the vitiated products; hence, ventilation and warming cannot in this case be one and the same thing, or at least be inseparable. The author, however, states that these stoves are the usual and most economical means adopted for heating small cottages and suburban dwellings in the country. With a working description of hot-air furnaces we come to the end of a series of facts and theories, which, although generally understood, are useful reminders upon a subject of all-round interest.

CORRESPONDENCE.

Audi alteram partem.

[All communications must bear the signature of the writer, not necessarily for publication.]

UNPATENTED INVENTIONS.

Having in the practice of my profession observed that exhibitors of unpatented inventions at international and industrial exhibitions are not generally aware that their position is affected by certain provisions of the 'Patents, Designs, and Trade Marks Acts, 1883,' I beg to point out through the medium of your paper that the six months' protection of unpatented inventions so exhibited is no longer accorded unconditionally, such protection being now obtainable only by compliance with Sect. 39 of the above-mentioned Act and Rule 17 of the 'Patents Rules.' Details of the mode of procedure may be obtained from the proper official sources of information, or I will supply information without charge on application.

W. T. WHITEMAN,

Fellow of the Institution of Patent Agents.
7 Staples Inn, W.C., November 21.

VENTILATION AND VENTILATORS.

Referring to Mr. W. P. Buchan's letter in your November number, p. 241, we would suggest a competitive test, on some such basis as the following:—

1. That the term 'ventilator' be understood to mean 'The apparatus from the point where the plain shaft ends, to the extreme summit of such apparatus.'
2. The 'ventilator' to be capable of being contained within a cube of given dimensions.
3. The U-tube used for testing to rest on a pivot, so that it could be rotated as occasion demanded—(*i.e.* to insure the wind blowing directly through the U)—neither

ventilator being allowed to get to windward or to leeward of the other.

4. The circumference of the shaft immediately below the 'ventilating heads' to be marked off in eighths of a circle, numbered 1 to 8, and tests to be made in each of the eight positions.

5. Eight tests to be taken with ventilator 'A,' on arm '1' of the U tube, while ventilator 'B' is on arm '2,' and eight more tests to be taken with the ventilators transposed.

On some such basis as urged in this and our previous letter, p. 189, a reliable result could be obtained.

For our own part, we are willing to enter into competition with any firm who will agree that the loser shall forfeit a specified sum of money to a given charity.

This suggestion seems to us more practical than making statements to the effect that 'We have obtained . . . medals,' that we were 'unaware that such and such tests were taking place,' or that 'our ventilator is the best in the market.'

With regard to the U tube test not being a new idea we did not for one moment suppose that it was. Our aim is not so much to seek after novelty, nor to lay claim to originality, as it is to endeavour to become apt exponents of laws which are founded on natural phenomena.

SHARP & Co.

AWARDS FOR VENTILATORS AT THE HEALTH EXHIBITION.

With reference to the inconsiderate letter of Robert Boyle & Son in your issue of the 15th, I may state that the writers are much in error so far as I am concerned, at least, as testing engineer to Jury 10. 1. They *did* know that tests were to be made of ventilators. 2. They were *not* excluded from the testing-rooms. 3. They were invited by me, in a letter dated Sept. 9 last, for the July 10, to send their ventilator for testing in the same terms in which other invitations were issued. I hold their acknowledgment of receipt of that letter of invitation, dated Sept. 12, in which they state that they cannot comply with my request. 4. 'The bottoms of the pipes attached to the ventilators' were not inside the 'tube' as they call it, which was 10 feet in length, not 8 feet. They were outside, and completely isolated from the action of the current.

As for their threat of sifting something to the bottom, let them sift away. They may come to a mare's nest.

D. K. CLARK.

8 Buckingham Street, Adelphi, London, W.C.

November 25, 1884.

In your issue of November 15 we see that Messrs. Robert Boyle & Son appear to be suffering most acutely from their failure in obtaining the principal award for ventilators at the International Health Exhibition; but we have no doubt most ventilator makers will agree with us when we state that this is the first exhibition in England where ventilators have been *tested* in the proper sense of the word. In compliance with a written invitation from the testing engineer, acting on behalf of the International Health Exhibition Jury No. 10, we sent a nine-inch ventilator to the testing-house, No. 10 Moreton Gardens, having first called to ascertain the mode by which the proposed contest was to be carried on. Finding that the *modus operandi* was as fair for one ventilator as another, whether of the form of Messrs. Robert Boyle & Son, other makers, or our own, we decided to send our ventilators. Now the purport of our present remarks is *solely* to refute misstatements contained in Messrs. Robert Boyle & Son's letter—the good taste it displayed we leave your readers to judge. The tests were certainly not carried out in the manner stated by Messrs. Robert Boyle & Son. When our ventilators—the Rotating Cowl and the Fixed Finial Ventilator—were delivered at the 'testing-house' our

representative noticed that several other makers had previously sent their ventilators. He inquired if Messrs. Robert Boyle had sent. The reply was in the negative. Inquiry was then made whether invitations to this contest had been sent to *all* exhibitors of ventilators, and an affirmative reply was received. After this, inquiry was made at Messrs. Robert Boyle & Son's exhibit whether they intended to send one of their ventilators to the testing-house, and their representative's reply was 'Oh, no; our ventilators are sufficiently well known to the jurors,' &c. It is, therefore, clear that Messrs. Robert Boyle & Son must have been aware that tests were being made, even assuming that their invitation to the contest did not reach them. We have before challenged Messrs. Robert Boyle & Son to a single combat, and we now do so again on the same terms; the loser to pay expenses of contest, and to forfeit his or their 100%, which shall be paid to some charitable institution; and *we* will further agree to forfeit the medal which has been awarded to us at the International Health Exhibition if we are the losers. This challenge to be taken up within one month from date, after which time (if not taken up) we shall consider that Messrs. Robert Boyle & Son admit the superiority of our ventilators over their so-called 'Self-acting Air Pump' ventilators.

We regret being obliged to ask you for so much of your valuable space, but we do so in the interest of fair play and truth.

BROTHERS & CO.

11 Billiter Square, E.C.

Upon first reading Messrs. Robert Boyle & Son's letter of complaint, stating (as they do on page 241) that they were *not asked* to send in their ventilator to be tested, and that they *knew nothing* of the tests until *after they were completed*, I felt somewhat inclined to sympathise so far with them, and more especially as I was disappointed at the absence of their ventilator from the testing-room, having looked forward to the chance of showing that my ventilator had again beaten theirs in the testing match.

Seeing, however, that Mr. Clark, the gentleman who conducted the testing, asserts that not only were Messrs. Boyle invited on Sept. 9 'to send in their ventilator for testing,' but he also holds a reply from them declining to do so, it is very curious, to say the least, how Messrs. Boyle can write as they have done.

Their ignorance of the testing of the ventilators that was going on, or was to be made, is all the more difficult to believe in, seeing that Messrs. Banner Bros. & Co. state that, observing the absence of Messrs. Boyle's ventilator from the testing-room, they called at Messrs. Boyles' stand at the Exhibition and spoke to their representative there on the subject. Under these circumstances, and as Messrs. Boyles' principal place of business is in London, it appears to me that no one is to blame for the absence of their ventilator from the International Health Exhibition tournament except themselves. Had they had the slightest anxiety to be present, and had faith in their ventilator carrying all before it, they should have been there. To stay away from the fight, and then after all is past fill every journal with their laments at not having had a chance to display their wonderful prowess, throws even the redoubtable Falstaff into the shade.

Messrs. Boyle say they 'understand' the method of testing was a farce, and that a tube '8 feet long by 3 feet square' was used, and that the pipe of each ventilator was inside the testing tube as well as the body. Now, the tube was not '8 feet long,' neither was it '3 feet square,' and the foot pipe of each ventilator was not inside the testing tube. Seeing they have made so many mistakes upon hearsay evidence, their opinion upon the method of testing cannot count for much, and more especially as it was not made known until all was past. I think, as one who did go in for the testing, that as Messrs. Boyle were absent from it their opinion on the subject is quite uncalled-for and superfluous.

It is true the method of testing was not what it should have been, but it was, or is, for those who sent in their ventilators to complain if not pleased.

Being in London on Oct. 20 to attend the Plumbers' Congress I looked in for a few minutes at the testing-room, it happening to be the last day of the testing, and saw the *modus operandi* of testing, and considered it was bound to give misleading results, so I asked Mr. Clark to have two of the ventilators tested inside in his style—say my ventilator and any other he liked—and then test the same two against each other by exposure to the wind above the roof, and thus compare the results; but he said he had no time for that. I therefore looked in again at the premises next morning and measured them, also the apparatus for testing, and afterwards wrote to the jury objecting to the method of testing as being likely to give misleading results. This letter was posted in London on the morning of Oct. 23, and was received by the secretary, but no reply from the jury has come to hand till this date. I asked that no awards should be published for exhaust ventilators until better experiments were made, but I expect the jury had dispersed before my letter arrived on Oct. 23.

The testing was made altogether *inside* a small room only 22 feet long. Two hand-driven fans, each with 8½ inch dia-delivery-pipe, were set up at one end, which blew air into a 10 feet long wooden tube, 3 feet high by 2 feet 6 inches wide at end nearest the fanners, and 4 feet high and 2 feet 6 inches wide at other end, which was only about 5 feet back from the solid wall. The ventilators to be tested were placed one at a time at end of tube farthest from the fanners. The effect of this arrangement was that, while the small-bodied ventilators showed pretty well, a larger sized one was placed at a disadvantage, owing to the tube being too narrow, and the dead wall in front of tube not allowing the wind to get forward to exert any pull upon the front of the large sized ventilator. In short, testing one of the small ones against my 22 inches in body one was like setting a tug-boat to run a race with a six days' Atlantic liner in a farmer's duck-pond.

We were asked to send in a ventilator for a 9-inch pipe, so, expecting Messrs. Boyle might perhaps send in a 27-inch one, I risked a 22-inch one, but, had I known the style of the testing, I would have been better with only a small 15-inch or an 18-inch one, or perhaps better still with my *chimney can*!

Some of the competitors saw the testing-room before the testing began, and so had an advantage over provincials like me who did not; while some again sent in *two* ventilators to be tested, and so had a double advantage. How my one managed to get a medal even under the untoward circumstances in which it was tested I do not know. Only had it got the ghost of a fair chance there was nothing I saw that I believe could have come near it. I intend to have some *open air* tests made to see as to this.

W. P. BUCHAN.

21 Renfrew Street, Glasgow.
Dec. 4, 1884.

We are not going upon the lines of the counsel, who when one finds the case going against his client, immediately turns round and abuses counsel on the other side. No one can offer Mr. Kite heartier congratulations than we do on his success, and we think whoever knows him as well as we do will think him well deserving anything good conferred upon him. He is a man who attends to his own business, and leaves others to attend to theirs, and we are at a loss to see how Mr. Kite can in any way be held responsible for the acts of the jury or the scientific gentleman who tested the ventilators. We do accuse them point blank of unfair actions, and to this they have pleaded guilty. If a criminal hears a charge brought against him, and the judge asks him what he has to say to the charge, and he keeps silent or answers 'Nothing, my lord,' that is in fact

a plea of guilty. The following correspondence shows they have no other plea to put upon the record will be seen in their answer to our inquiry. We did ask them or hint at their altering their decision, but did ask to be informed why we were prohibited sending a ventilator to be tested, and to this they have ventured one word of reply. If there was any reason why we should be so treated, what could be easier than for them to have revealed the reason? We asked no questions why the awards were so. We never questioned their right to do so. We express no dissatisfaction at the awards they made. Still we give our opinion, and shall say something about it at a future time. No. We asked the simple question which have totally failed to answer.

The following is a correct copy of our letter and replies thereto:—

Ours to E. C. Owen, Oct. 27, 1884.

Owen to us, Oct. 28, 1884.

Winter to us, Oct. 31, 1884.

Winter to us, Nov. 28, 1884.

[COPIES.]

International Health Exhibition
(No. 1,070, Class 25).

October 27, 1884

Edward Cunliffe Owen, Esq.

Dear Sir,—As an exhibitor and competitor in the class, I feel it my duty to ask for what reasons I was invited to send a ventilator for the purpose of being tested. I am informed by other exhibitors that only all except myself had that privilege. If there is any reason why I should be prohibited from competing should be very glad to know. Seeing that every exhibitor has some award, I know nothing of the arrangement except by hearsay. Your attention will oblige.

EDGAR ALDOUS

[REPLIES.]

International Health Exhibition
South Kensington, S.W.

October 28, 1884

Dear Sirs,—I beg to acknowledge the receipt of letter of the 27th instant, which I will place before the Jury Commission.—I am, dear sir, yours truly,

EDWARD CUNLIFFE OWEN
Secretary.

Messrs. Edgar Aldous & Son,
I.H.E., No. 1,070, Class 25.

International Health Exhibition
South Kensington, S.W.

October 31, 1884

Jury Commission.

Dear Sirs,—I beg to acknowledge the receipt of letter of the 27th inst., which shall receive attention.

Yours faithfully,

THOMAS WINTER,
Jury Superintende

Messrs. Edgar Aldous & Son.

International Health Exhibition
South Kensington.

November 28, 1884

Sirs,—I beg to inform you that your letter of Oct. 27 has duly been considered by the Jury Commission, and that they have decided, after consulting with the rest of the Jury No. 10, that no sufficient grounds exist to interfere with the awards of the jury.

I have the honour to be, sir,

Your obedient servant,

THOMAS WINTER,
Jury Superintende

Messrs. Edgar Aldous & Son.

We are inclined to think after getting such a reply to our letter of Oct. 27, any unprejudiced mind must be

conclusion that we were not only badly treated by being prohibited from sending a ventilator to be tested, an insult is added thereto by the responsible parties giving a semblance of a reason in their answer to our query, and this cannot fail to open the eyes of your readers to the conduct of gentlemen who act as jurymen at exhibitions. In our letter to the *Architect* journal of the 22nd last, we challenged the accuracy of Messrs. 'Boyle Bros.' statement that they had been informed by official authority that everyone had been invited to compete; that firm has not verified their statement. As we again declare we had no invitation to send a ventilator for testing, and the Jury Commission have not ventured their reply to say we had; therefore this must be conclusive. Consequently our Ventilator has not been beaten by any of the number at the Health Exhibition, and the public will please understand the reason why our names do not appear in the list of Awards—viz. for the reason we were not allowed to compete, otherwise we have no doubt about the matter.

EDGAR ALDOUS & SON,
Ventilating and Sanitary Engineers.
Elmhurst, Upton Lane, Forest Gate.

As winners of the highest award, the Gold Medal for Exhaust Ventilators, class 25, we shall be glad to permit us to give our views on the matter, as, if the testing is to be considered a farce, any result we might naturally expect to derive is gone.

We regret that, from whatever reasons Messrs. Boyle's Ventilators were not tested, such omission took place, but in contention that the tests were useless certainly negates that complaint. With regard to testing ventilators really we will not express our opinion on a subject on which those who should be better judges than ourselves do not seem to agree. With respect, however, to the test employed by Mr. Clark, we would ask if its conditions did give a fair chance to all the competing ventilators. Anemometer testing may not be accurate as regards the individual capabilities, but taken comparatively would it be calculated to show a correct result?

A weighing machine might be a few pounds out, but could tell by it which of a certain number of pieces was the heaviest.

We do not see how any artificial test could be applied to the air currents ventilators are subject to in use on various parts of buildings, and therefore a simple test by which all stand an equal chance seems to us the perfectly fair means of arriving at a result. Under any circumstances there would be an outcry from the losers, a practical test of any kind gives a priority to the winner beyond awards, made from reasons only known to the judges themselves. An advertisement of one of our correspondents refers to a so-called ventilation competition in which the firm in question was successful of which we had not previously heard, but from enquiries we believe the entries were very limited, and that there was no test whatever.

We are sure this kind of thing is more calculated to lead the public than the awards at the Health Exhibition, which the same firm deplore principally we believe that ground.

We feel assured all right thinking people will deplore the attacks made on the jury and tester. They had a difficult task to perform, and there is not the slightest doubt it was conscientiously and with every desire to reach a right decision. We do not believe that they were unscientific or incompetent; and however much the system is criticised, it should be borne in mind that their duty was set them, that they were selected as men of ability, and that they did their best without malice or ill-will.

C. KITE & CO.
Christopher Works,
Chalton Street, Euston Road, London, N.W.

We observe in several contemporaries that our statements with respect to the non-invitation of certain exhibitors of ventilators to the testing, and the farcical nature of the tests, are fully corroborated by other exhibitors who were also *not invited* to the tests. On the face of this, how can it be asserted, as it is, that *all* were invited?

The more light that is thrown on this lamentable fiasco shows but all the more conclusively that there has been, to put it mildly, sad mismanagement somewhere, and it is only right, seeing that this is a public matter, that the public should know who is responsible for it, and also that measures should be promptly taken to secure the rectification of the blunder which has been committed, otherwise a lasting reproach will not only rest upon the conduct of Jury 10 and their testing engineer, but upon the Health Exhibition itself, and an injury will be done to the cause of sanitary science by bringing it into ridicule and contempt with the public that will take many years to eradicate.

As showing the opinion of the press on the matter we beg to give an extract from a lengthy 'leader' which appears in a contemporary:—

'In view of the remarks of Messrs. Boyle & Son, published in our present issue, it would appear that some strange mismanagement has overtaken the jury which decided the "Ventilation" awards at the Health Exhibition. If, as Messrs. Boyle say, their well-known ventilators were not included in the list of apparatus tested, and if their position as competing exhibitors has thus been practically ignored, we certainly feel entitled, in the interests of "fair play and no favour," to ask for an explanation of these anomalies. We approve of the demand of Messrs. Boyle, not only on account of the alleged grievance of that firm alone, but of all other firms who have competed in the section alluded to, whether they have received awards or not.

'No firm of inventors can have the slightest satisfaction in receiving any award the fairness and impartiality of which can be called in question. We are certain, therefore, that we only re-echo public sentiment and professional opinion when we ask that such a matter as that to which attention is being directed should be fully investigated. If exhibitions and their juries do not obtain the confidence of the public, the mainstay of these institutions is at once sapped and destroyed.'

A correspondent who signs himself 'An Architect' says 'It is to be regretted that gentlemen more practically scientific were not appointed to adjudicate on ventilators at the Health Exhibition.' And he asks, referring to the tests, 'Could any greater farce in the name of science be enacted?' All that we can say in reply to this query is, 'Time will show.' We believe, after what we have seen, that anything is possible in these days.

64 Holborn Viaduct, ROBERT BOYLE & SON.
Dec. 1, 1884.

THE INTERNATIONAL HEALTH EXHIBITION AWARDS.

I have observed in your columns complaints made by exhibitors in respect of the awards made for ventilators and filters, and I now beg to protest against the awards made in respect of the disinfectants exhibited at the Health Exhibition.

No practical investigation of the comparative merits of the different exhibits, as antiseptics, disinfectants, and oxidising agents, was made, and therefore it is not surprising to find that while gold medals have been awarded to certain chemical products which have been in use for generations, no award has been made in respect of the 'Sanitas' disinfectants, which have been adopted for use in preference to the said older preparations by a large majority of the Public Health Authorities in this country. A bronze medal was awarded to 'Sanitas' soaps in Class 31, but the 'Sanitas' Company very properly declined to receive such an award, as they could not consent to receive anything less than a gold medal.

The widespread dissatisfaction of the exhibitors, and the intrinsic merits of Messrs. Boyle's ventilating appliances, the Spongy Iron Filter, and the 'Sanitas' disinfectants, afford sufficient evidence of the unsatisfactory character of the awards.

Being acquainted, by personal experience, with the manner in which jurors at exhibitions are expected to discharge their duties, and the poor facilities that are afforded them for making adequate investigations, I do not hesitate to express a very strong opinion that it is quite time to put an end to awards made under such circumstances by irresponsible jurors. I feel quite sure that many manufacturers would be perfectly satisfied with the exhibition of their wares without looking for any kind of award, and considering that no, or very little, commercial value attaches to such awards (which are known to be generally founded upon imperfect knowledge or imperfect trials), it would be far better that, if exhibitions must be held in such great number, they should be conducted without awards.

In conclusion, so far as disinfectants are concerned, I protest against the awards made by the jurors of the Health Exhibition, and I consider them grossly unfair and entirely unworthy of scientific respect.

C. T. KINGZETT, F.I.C., F.C.S.

VENTILATION OF THE 'CASTALIA' NEW SMALL-POX HOSPITAL SHIP.

In the account given of the above, it is virtually stated that, in order to ascertain the value of wind-acting exhaust ventilators, they must be tested in practice. Now this is very good, only the practical test requires to be carried out in a practical manner, but I can see no evidence of such having been done from the description given on pp. 239 and 240 of your issue for Nov. 15.

We are informed that the currents of air going through the ventilating-pipes were measured, and that the amounts were very good, but we are not told whether this was due to the action of the ventilators, or to that of the pipes, for no mention is made of lifting off a ventilator to see whether the current went on better with the ventilator off or with it on. Consequently, to refer to the so-called experiments at the *Castalia* as being better than those made at Kew or elsewhere—as, for example, those described in THE SANITARY RECORD in the spring of 1878—is giving them more credit than, in my opinion, they deserve. It was stated on p. 190 of this journal for March 22, 1878, that a current of air which was going up a ventilating-shaft which had a Boyle's ventilator on it, was not due to the action of the ventilator, as when said ventilator was lifted off the upward current still went on; and, further, after the Boyle's ventilator had been replaced, and new testing made some hours after—viz., at 8 P.M.—instead of an up-current, there was a steady down-draught. Then, as further related on p. 222 of this journal for April 5, 1878, practical experiments or tests were made in presence of the late Mr. Robert Boyle, sen., when, even with windows open, a large amount of down-draught occurred in the ventilating-pipe, which was surmounted by a Boyle's Ventilator standing above the ridge, and freely exposed to the wind. Then, to give a ship test, it so happened that, before it was finally decided what ventilators to put upon the last four new additions to the Clan Line of East India steamers, experiments were made by the engineers, when, owing to the large amount of down-draught Boyle's Air-Pump Ventilator showed, it was set aside, and my ventilators used instead; so I beg leave to set the practical tests then made and since going on upon these four steamers against the *Castalia*. If there is really always a continuous up-current in the ventilating-pipes of the *Castalia*, Messrs. Boyle are to be congratulated upon their good fortune, but I think it is scarcely fair to drag in Sir Charles Dilke in support of this, for I hardly think that he would order a ventilator to be lifted off, or experiment during night as well as in the day time. In

fact, I don't suppose he did anything except pay a passing visit in the day time, when every thing would be done to make the hospital show off for the best.

It is stated on p. 240 that not the slightest down-draught has been found through any of the ventilators. If by this it is meant that no down-draughts have taken place, I am unable to comprehend this unless there are self-closing valves in to prevent it. Are there such? If so, give the valves the credit and not the ventilators. Without them, guarantees and testimonials are in thousands of cases mere waste-paper.

Either to puff up or guarantee as perfection an appliance which acts with such a variable motive power as the wind is an absurdity, while to point to large sales as sure evidence of good quality is a proof that might be brought forward by some medicine vendors to show that skilled physicians are superfluities—all that is needed being so-and-so's patent pills.

If Messrs. Boyle & Son's ventilators really always did what they are said to do, and were really entirely free from down-draughts, they ought to have, or might have, got the gold medal at the Health Exhibition even without testing there; but their absence from both the testing-room and the award list rather looks as if a good many people do not altogether believe in them. And what has taken place in the autumn of 1884 goes to prove that what was said in these columns in the spring of 1878 was pretty correct. The Kew experiments were useful, but the deductions which many people have made from them have been rather sweeping; even scientific men rushing from the extreme of laudation to that of condemnation, entirely ignoring that there is a happy mean in everything, and also acting as if no improvement were possible upon the three unfortunate appliances tested at Kew in A.D. 1878.

W. P. BUCHAN.

21 Renfrew Street, Glasgow, December 4, 1884.

WATER FILTERS.

Having seen a letter from the Spongy Iron Filter Company, which appeared in the columns of the SANITARY RECORD of Nov. 15, concerning my 'International' Water Filter, I beg to ask you to insert my reply to same. I am sorry that the Spongy Iron Filter Company have not enough confidence in their filter to accept the challenge that I have advertised in all the leading sanitary and medical papers. In the letter in question, in the first place the Spongy Iron Filter Company object to the use of animal charcoal in water filters. I perfectly understand why they object to this; but let the filtering medium be animal charcoal, proto-carbide of iron, silicated carbon, or spongy iron, or any other suitable ingredient, unless scientifically constructed or placed, it will materially add to the dangers we desire to evade rather than remove them. It is in this direction that I have for a considerable time laboured, and am satisfied with my results; hence the 'challenge,' of which, if the Spongy Iron Filter Company doubt the *bona fides*, they can soon satisfy themselves, by remitting you 100*l.*, which I will immediately cover, and fight on the points as laid down in the challenge. I cannot 'state a clearer case' which can easily be understood by anyone. If the Spongy Iron Filter Company keep out of the field owing to my not disclosing the nature of the composition of the cone block which I have patented, I will use nothing but pure animal charcoal in my filter during competition. The Spongy Iron Filter Company seem anxious to add one more point to my challenge, which they say is 'remarkably absent—viz., the chemical and physiological purification of the filtered water.' Allow me to call their attention to point six in the challenge, which states that the water to be filtered for the first two months must be taken from below London Bridge; also to point eleven—The purity of such water when filtered. I ask you, sir, whether this is sufficient or not? My object was, whilst framing my challenge, to embrace all defects or faults which are usually found in water filters, and the

majority of which I feel confident are absent from my own; and, in the interest of myself and the public, test same on the merits of the filter, according to the terms as laid down by me. In paragraph 5 the Spongy Iron Filter Company complain as to their 'intelligence,' and well they may if they contend that 'printed papers' have anything to do with the 'purifying action of a filter or the durability of same.' In a filter constructed on the principle of the Spongy Iron Filter Company's, the medium, whatever it may be composed of, would lose its oxidising powers in *one day* after filtering Thames water below London Bridge. I further add that the Spongy Iron Filter Company's filter would absolutely refuse to pass water through the filtered tap after filtering this water *one day*! This proves the necessity of a filter that will enable a person, however inexperienced, to effectually cleanse same at will, thus preserving the medium from contamination. When the Spongy Iron Filter Company speak of the filter being provided with two taps, and ridicule the idea, my explanation will show that they know nothing whatever about the construction of the International, as the *lower* or *sediment* tap is provided with a loose or movable key, which in a properly regulated household ought to be in the custody of the mistress; therefore 'servants' would not only be prevented from making mistakes as to which water tap to use, but would by this means be detected if they neglected to make frequent applications for the key, in order to cleanse the filter daily, or as often as would be necessary. Under these circumstances I say, in answer to the Spongy Iron Filter Company, that this should be sufficient to guarantee that *servants* will use the right tap. It is also not the fact that the 'International' has been promoted to the 'Universal' Filter, or that such a change has even been thought of. The English and foreign patents are exclusively my own property, together with all connected therewith. I hope the Spongy Iron Filter Company will either come forward and accept my challenge or own themselves defeated.

J. P. SAWYER.

1 Arthur Street West, London Bridge, E.C.

PARKS AND OPEN SPACES.

*The law condemns both man and woman
Who steals the goose from off the common;
But lets the greater felon loose,
Who steals the common from the goose.*

AT a recent temperance meeting at Leicester the Bishop of Peterborough said:—People talked of closing licensed houses as if it were an easy thing to do; but let them picture to themselves an artisan, with his wife and children, walking out on Sunday four or five miles in London, seeing all along the closed shops dull and uninteresting, and only two places open—the one the public-house where he could have a seat and welcome, and the other the church where he could not always have a seat and welcome. Some people fancied that they would succeed in driving all these into a church by the mere and single act of closing the only rival of the church. Let them close public-houses if they thought it right and necessary, but let them for pity's sake provide for those in whose face they shut the only place that they were accustomed to look upon as places of resort and amusement something else and something better. Let them give the people healthy recreation, innocent, elevating amusements, and open spaces in the great towns. By such means they would promote the great cause of temperance and check the great evil of intemperance.

The Corporation of Tynemouth are now employing a considerable number of persons in laying out the beautiful site at the North Dene, recently presented to the borough for a public park. This step has materially assisted in relieving much of the distress felt in that town from dearth of employment.

HOUSING OF THE WORKING CLASSES.

*'How best to help the slender store,
How mend the dwellings of the poor?'*

OVERCROWDING IN NEW YORK.—According to a report recently presented to the Tenement-house Commission of New York City, the conditions under which thousands of the population of New York are compelled to live are worse than anything recorded in London or the large cities of the United Kingdom. The report states that 562 tenement houses visited by the inspector contained 5,050 families and 20,117 persons—an average of nine families and over thirty-five persons to each house. In many of the houses the occupants reached four times this number. In 90 per cent. of them the closets were in foul condition, 10 per cent. being most dangerous to the health of the inmates. It is suggested, in view of these revelations, that the Commissioners should be able to recommend to the Legislature some practical measure of relief, and to reinforce their recommendations by an amount of testimony as to the need of immediate action which will make the defeat of those measures impossible, no matter how vehement may be the opposition of interested and inhuman landlords.

The following figures in reference to Herr Krupp's establishment at Essen are of interest, in connection with the question of housing the working classes by employers of labour:—In 1860 Herr Krupp's factory at Essen employed 1,764 hands; in 1870 the number of workmen had risen to 7,084, and the present number is about 20,000. Including the wives and children of the employed there are 65,381 souls depending for their subsistence on Krupp's works, 20,000 of these inhabiting houses belonging to Herr Krupp.

A further demolition of working men's houses in the centre of Newcastle is contemplated by the proposed new approaches to the Central Railway Station, and the additions to the Post Office. The parish of St. John, in which most of this property is situate, has already suffered a diminution of about four thousand of its working-class population in consequence of other 'improvements' which have been carried out since the present vicar, the Rev. E. H. Houldey, entered on his charge. The working class are being gradually driven to the outskirts of the city.

During the course of the ceremonial at the laying of the foundation-stone of a steam sanitary laundry in connection with the St. James's Home for Female Inebriates at Ebenezer Terrace, Kennington Park, Mr. Samuel Morley, M.P., said that, as a member of the Royal Commission for Inquiring into the Dwellings of the Working Classes, he had been struck with the evidence of relieving officers and others, which showed that by far the greater part of the misery of the poor was traceable to drink, and that three-fourths of the inmates of the London workhouses became paupers from the same cause. At another meeting, presided over by Lord Chelmsford, in reference to some remarks made by the chairman, Mr. Morley further said the revelations that had come to the knowledge of the Commission were simply appalling, especially in London. In some cases six and eight children were living with their parents in a single room, involving a condition of things, physically and morally, that was sickening to contemplate. The remedy for all this was the great problem of the day. But if the people would keep out of the public-house they might remove from their wretched hovels in a fortnight. The people had the remedy very much in their own hands. If, say, 100,000,000*l.* out of the 120,000,000*l.* annually spent in drink was diverted into channels of industry by the purchase of clothing, furniture, and household comforts, the mills of Yorkshire and Lancashire would be kept going and trade

and industry everywhere would revive. Thus, too, would be bridged over the great gulf that now existed between the rich and the poor.

CREMATION NOTES.

A CREMATORY FOR NEW YORK.—The corner-stone of a crematory temple was laid at Mount Olivet, Long Island, on November 20. The proposed edifice is being built by the United States Cremation Company, which expects to complete its work by February next. Twenty bodies already await incineration. The cost of the building is about 10,000 dols., that of incineration 10 dols. to 25 dols. The building is in the shape of a Greek temple, 40 by 72 feet. Incineration will take place at a temperature of about 2,500° F. It will require about forty minutes per 100 pounds of the subject, and will leave about 4 per cent. in weight of a pure pearly ash. No smoke will be visible, and no odour perceptible during incineration. The basement will also contain a *refrigerarium*, where bodies may be kept when desired awaiting the arrival of friends from a distance; also a *calidarium* for cases of possibly suspended animation, the high temperature of which will induce speedy evidences of life or death, as the case may be. There will be also in the basement an *edicularium* or urn room, and an atelier. This last will be used also for making autopsies, which will be required in all cases wherein it is not clear that death is the result of natural causes. The body of the building, or the ground-floor, will be fitted up as a chapel, where any service desired may be held.

The Italian Government has ordered the building of a crematory, on the Gorini-Gozzi system, for the cholera hospital at Varignano.

It is proposed as a measure of economy to burn the dead paupers of Brooklyn, instead of, as is at present the practice, burying them in two-dollar soap-boxes. The *New York Medical Record* remarks on this, that however admirable this scheme might be, practicable men will see the futility of trying to carry it out, since it would prevent the Brooklyn politicians from making their usual percentage on each coffin.

The first instance of the cremation of a priest in Italy recently occurred in Milan. The Rev. Don Giovanni Sarterio had left instructions by his will that his body be burned, and had disposed that in case of non-compliance with his wishes the heirs should forfeit the inheritance. As soon as this became known, the eleven priests who had been retained to perform the funeral service returned their fees, and the priest's remains were committed to the flames unaccompanied by any Christian rite.

The Cremation Society of England announce that they are prepared to undertake cremations under due restrictions and certificates, particulars of which may be obtained by communication to Mr. William Eassie, C.E., honorary secretary of the society, 11 Argyll Street, W.

THE PLUMBERS' COMPANY.—According to the report recently published of the Livery Companies Commission, the Plumbers' Company was incorporated in 1611; it has fifty members of the Livery; its corporate income is 882*l.*, and trust income 18*l.* Its ordinances, as shown at page 292, bear date 1365.

At the last monthly meeting of the Jarrow Town Council the Sanitary Committee reported that they had found the land laid out for building sites in Derby Street quite unfit for the purpose. During the construction of the sewers, the contractor had to cut through a quantity of night soil and other refuse which had been deposited there. Orders were given to prevent the erection of any dwelling-houses till the ground was put into a satisfactory condition.

SANITARY JOTTINGS.

UNSANITARY SURROUNDINGS OF AN ARCHBISHOP'S PALACE.—At the last monthly meeting of the York Sanitary Authority Mr. J. L. F. Marshall, the Officer, stated that his attention had been called to a cesspool behind the stables belonging to the Archbishop of York. On examination he found it received the drainage from a water-closet recently erected over the stables. There was no ventilation to the cesspool. The drainage supply to the closet was collected from the roof. When he visited there was no water in the trap of the closet, the stench in the room was very bad, the gases from the cesspool passing freely into the room. He informed that the cesspool had not been emptied for many years. The overflow pipe also emitted a most offensive stench. Several members of the Board expressed astonishment that such an unsatisfactory state of things should exist so near to the Archbishop's Palace. The Medical Officer further stated that he had examined samples of water used at Bishopthorpe, and he found one of them fit to drink. Four of the samples were supposed to be filtered. He also had other evidence of singular neglect of sanitary matters in his district.

The Corporation of Newcastle, in view of the amount of distress existing in the district, has asked the city engineer to give employment to as many men as possible on the various public works now being carried out by that body.

At the last meeting of the Gateshead Town Council Mr. Dunn drew attention to the unsatisfactory state of their present building by-laws, which were practically useless. If they got an epidemic in the town they would not object to expense in order to get the matter right. He thought that in Gateshead they seemed to be waiting for panics.

About 80 per cent. of the cases of zymotic disease notified to the medical officer of health for Newcastle in the past month were cases of scarlet fever.

Samuel Boyce Newling, grocer and provision merchant of 3 Johnson Place, Harrow Road, was fined 10*s.* on October 21, to the prejudice of the public, for selling half a pound of coffee adulterated with chicory to the extent of 50 per cent.

The *Chicago News* states that the tenement inspection, under the New York State Commission, is progressing very satisfactorily. A conference recently decided that unless some change was made in the commission, the aim desired would not be attained. It was stated that the trouble was that so much of the testimony was being taken on unimportant subjects.

The following new version of an old rhyme was given by Mr. H. E. Armstrong, the Medical Officer of Health for Newcastle-on-Tyne, in the course of the discussion on a paper on the Notification of Infectious Diseases, read by Dr. Alfred Hill, Medical Officer of Health for Southampton, at a conference on sanitary subjects, held at the International Health Exhibition in June last. Mr. Armstrong said that it was evident that some of the men who took part in the discussion had come to the meeting with minds made up not to receive information and be convinced, but rather determined not to listen to anything that might be said. They seemed to have taken for their motto—

'Notification is vexation,

Inspection's twice as bad,

For isolation there's no occasion,
Disinfection drives me mad.'

The *Plumber and Decorator* is responsible for the following, let us hope, *jeu d'esprit*:—'The N. plumber seems to excel even his London brother in the very particular for which plumbers are said to be distinguished. Here is an American plumber's bill up Smith's busted pipes, to wit:—Going to see the leak, 1 dol.; coming back for tools and help, 2 dols.; the leak, 1 dol. 50 cents; sending for more help

25 cents; going for solder forgotten, 1 dol.; burned my finger, 2 dols.; lost my tobacco, 50 cents; getting to work, 3 dols.; getting my assistants to work, 2 dols. 50 cents; fixing the pipe, 25 cents; going home 2 dols. 50 cents; time, solder, wear and tear on tools, overalls, and other clothing, 5 dols.—Total, 23 dols. 50 cents.'

SEWERAGE.

Sir Joseph Bazalgette has submitted to the Lower Thames Valley Main Sewerage Board his report on his proposal for the sewerage of the united district. The broad features of the scheme are to collect the sewage of the various contributory places by sewers converging to a pumping station situated either on the east of New Malden or on a still more eligible site near Sutton Common Road—there to be raised into a tunnel sewer, the dimensions of which will be 6 feet 6 inches by 4 feet 4 inches, and through which it will be carried by gravitation, the sewer having a fall of nearly 3 feet to the mile, right away to a piece of land already provisionally secured at Crossness, lower down, but immediately adjoining the metropolitan reservoir, there to be disposed of in conjunction with the sewage of London; a proposal which, it is said, will find encouragement in the report of the Royal Commission which for some time has been considering the condition of the Thames. The scheme is estimated to cost less than 9d. in the pound. Sir Joseph Bazalgette assumes that two years will be required for the completion of the works, and he estimates the cost of pumping upon the basis of an increased population and rateable value in 1887. The total cost is put down at 563,711*l.*, and it is suggested that the annual charge for repayment of capital and interest, for pumping, contingencies, and cost of disposing of the sewage after its arrival at Crossness, will amount to less than 9d. in the pound, and that this rate will gradually decrease as the rateable value of the district improves. The report further states that the features which chiefly recommend the scheme are—that it requires no provisional order or Act of Parliament to enable it to be carried out; that it involves no interference either with Crown property or with the district of the Metropolitan Board of Works; that upon the sanction of the Local Government Board the works can immediately be proceeded with; and that the scheme would be final in its operations and results.

A scheme, called the Wandle Valley Main Drainage, has recently been completed for the Croydon rural sanitary authority. The district served embraces five villages, with a population of 17,000, and covers an area of 10,106 acres. The watershed contains sixty square miles of chalk, from which the Wandle is fed, and whence it runs over beds of alluvium overlying the London clay. The scheme is on 'the separate system,' the storm-water being provided for in the old sewers and water-courses, which have been improved for the purpose, while the new sewers as completed measure fifty-five miles, of which twenty miles have been laid with 9-inch Doulton pipes. The system was designed to allow as much of the sewage as possible to be carried to the land by gravitation, and where this was not possible a low-level sewer was laid, from which the sewage, after its arrival at the pumping-station, is pumped up into the gravitation outfall an average height of 20 feet, and then flows into the depositing-tanks. The sewage, after it has been deprived of floating matter, and when the solids have subsided in the tanks, is filtered through a 4-foot bed of coke, and then passes on to the land set apart for filtration and its final purification. The sludge is first treated with milk of lime, and then pressed into cakes 2 feet in diameter and 1½ inches thick; and a farmer in the neighbourhood has contracted for the cake produced for twelve months, paying a sum of 42*l.*, and undertaking to keep the works free from sludge cake. Owing to the area, some 29 acres, set apart for filtration purposes being very swampy and liable to be flooded, it was necessary to construct a clay-

puddle dam entirely round it, and to 1 foot below the surface of the London clay. In the upper portion of this area an artificial filter was made of alternate 3-inch layers of burned ballast and porous soil through which the sewage passed first into the natural filter. The land irrigated by the sewage in its passage is devoted to the cultivation of rye grass, for which there is a good demand, the crops realising 30*l.* per annum.

WATER SUPPLY.

WASTE-PREVENTERS.—The Birmingham Corporation have determined to adopt a waste-water system in the borough at a cost of 1,200*l.*, such as is in operation in Liverpool and certain other large towns, with the view of ascertaining the locality of waste when occurring, and so preventing it. The system is reported to have effected a saving in some large towns of 50,000*l.* per annum.

John Wynn, of Plaistow, has been summoned at the instance of the St. Luke's Vestry for not having any water supply or proper apparatus in connection with the closets of seven houses owned by him in George Yard, St. Luke's.—Samuel Mellows, sanitary inspector to the Vestry, said the houses in question were inhabited by poor people. The closets had no water supply whatever, and were in a dreadfully dirty condition, rendering the houses unfit to live in. The defendant was very well to do.—Corroborative evidence was given by Mr. Eadds, late sanitary inspector for the district. It appeared that Mr. Wynn had disregarded a notice from the Vestry to remedy the defects complained of last October.—Mr. Barstow now ordered the defendant to pay a fine of 10*l.* for each house, making a total penalty of 70*l.*

COMPETITIONS.

TOTAL ABSTINENCE.

THE President and Council of the British Medical Temperance Association have offered a prize of 100 guineas for the best essay on the physical and moral advantages of total abstinence from intoxicating liquors, to be competed for by medical students in the United Kingdom. The essays are to be sent in by March 31, 1885.

HYGIENE.

MR. HENRY LAMB, of Rochester, New York State, has offered, through the American Public Health Association, four prizes, of two hundred dollars each, upon the following four subjects: 'Healthy Homes and Food for the Working Classes,' 'On the Sanitary Conditions and Necessities of School-houses and School-life,' 'On Disinfectants and Individual Prophylaxis Against Infectious Diseases,' 'On Appliances and Means for Saving Life and for Protection against the Injurious Influences of Some Work and of Certain Occupations upon Health.' These prizes are open to universal competition, and will be awarded by four independent committees consisting of five members each. The American Public Health Association is to appoint three members of each committee, the National Board of Health one member, and the President of the Conference of State Boards of Health one member.

NOTICES OF MEETINGS.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1 Adam Street, Adelphi, London.

SESSION, 1884-85.

T. ORME DUDFIELD, M.D., President.

THE next Meeting of the Session will be held on Friday, Dec. 19, at 7.30 P.M. The Minutes of the last Meeting will be read. The Council will present a report on—1. A Special Report of the General Purposes Committee of the Metropolitan Asylums Board, on the question of the Reception and Treatment of Non-pauper Patients at the Managers' Hospitals. 2. Brick-burning as an offensive trade. 3. Revision of By-laws of the Society. To receive a letter from the Clerk to the Metropolitan Asylums Board on the subject of Hospital Accommodation for cases of Cholera. The following gentlemen will be balloted for as Members of the Society: Nominated by Mr. S. R. Lovett and Dr. C. E. Saunders—T. G. Blackman, M.R.C.S., Medical Officer of Health, Great Salterns; J. S. Taylor, M.D., Medical Officer of Health to the City and Port of Liverpool; W. D. Wood, L.R.C.P., Medical Officer of Health, Oxford (Combined) Urban and Rural Sanitary District. Nominated by Mr. Shirley Murphy and Dr. C. E. Saunders—A. Newsholme M.D. Medical Officer of Health, Clapham.

APPOINTMENTS UNDER THE PUBLIC HEALTH ACT.

MEDICAL OFFICERS OF HEALTH.

- BETHELL, Alfred, M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Bridgnorth Urban Sanitary District, at £32 per annum, *vice* Mathias, resigned.
- BOOTHBY, Philip, L.R.C.P., M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Basford Rural Sanitary District, at £400 per annum, from year to year, *vice* Butcher, resigned.
- BROWN, John, L.R.C.P.Lond., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Bacup Urban Sanitary District, at £30 for one year.
- BUGGY, Dr. John Joseph, has been appointed Medical Officer of Health for the Gainsborough Rural Sanitary District at £85 for one year, *vice* Paterson, deceased.
- COVEY, George, M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the East Grinstead Urban Sanitary District, at £20 per annum.
- CROWFOOT, Edward Bowles, M.B.Univ.Lond., M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Beccles Urban Sanitary District at £30, for one year.
- DE'ATH, Robert, M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Buckingham Rural Sanitary District, at £55, for one year.
- EDDOWES, Charles, M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Amesbury Rural Sanitary District, at £50 for one year.
- FUSSELL, Dr. Edward Francis, has been re-appointed Medical Officer of Health for the Seaford Urban Sanitary District, at £22, for one year.
- HALL, Egerton Francis, M.D.Univ.St.Andrews, L.R.C.P.Edin., has been re-appointed Medical Officer of Health for the Huyton-with-Roby Urban Sanitary District, at £32 per annum.
- HOFFMEISTER, William, M.D., L.R.C.P.Lond., M.R.C.S.Eng., and L.M., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Cowes Port Sanitary District, at £17 10s. per annum, until March 25, 1885.
- HOUGHTON, Lambert, L.R.C.P.Edin., L.R.C.S.Edin., has been appointed Medical Officer of Health for the Amersham Rural Sanitary District, at £50 for one year.
- McLACHLAN, Dr. Samuel French, has been re-appointed Medical Officer of Health for the Longtown Rural Sanitary District, Cumber. and, at £65, for one year.
- MADDEVER, John Coombe, M.D.Univ.Glasg., has been re-appointed Medical Officer of Health for the Brownhills Urban Sanitary District, at £45 for one year.
- MARSH, Frank, L.R.C.P.Lond., F.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Stafford Urban Sanitary District for one year (salary not yet fixed), *vice* Clendinnen, whose appointment has expired.
- MASON, Thomas Edward, M.D.Univ.St. And., M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Deal Urban Sanitary District, at £30 for one year.
- MERCER, Mr. William Frederick, of the Kentish Bank, has been appointed Treasurer to the Maidstone Guardians and Rural Sanitary Authority, *vice* Wigan, his partner, resigned from failing health.
- NEWSHOLME, Arthur, M.D.Univ.Lond., M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Clapham Division of the Wandsworth District, at £75 per annum, rising to £110, *vice* McDougall, resigned.
- OSBORN, Charles, L.R.C.P.Edin., M.R.C.S.Fnz., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Bognor Urban Sanitary District, at fifty guineas for the year ending Dec. 4, 1885.
- STEVENS, George Walter, L.R.C.P.Edin., and L.M., M.R.C.S.Eng., has been appointed Medical Officer of Health for the Toxeth Park Urban Sanitary District, Lancashire, at £45 per annum, *vice* McClelland, resigned.
- SYKES, Walter John, M.D.Univ.Edin., has been re-appointed Medical Officer of Health for the Portsmouth Urban Sanitary District at £45, for one year.
- WEBSTER, George Leonard, M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Bewdley Urban Sanitary District, at £20, for one year.

SURVEYORS, CLERKS TO GUARDIANS, INSPECTORS OF NUISANCES, &c.

- ALLEN, Mr. Joseph, has been appointed Collector and School Attendance Officer to the Failsforth Local Board and Urban Sanitary Authority, at £30 per annum, *vice* Taylor.
- ANSCOMBE, Mr. Joseph A., has been appointed Inspector of Nuisances for the Hamlet of Penze in the Lewisham District, at £100 per annum, *vice* Butcher resigned.
- BAILEY, Mr. Joseph, has been appointed Collector to the Melton Mowbray Local Board and Urban Sanitary Authority, at £40 per annum, *vice* Betts, resigned.
- BOWEN, Mr. E. P., Manager of the Leominster branch of the Worcester City and County Banking Company, has been appointed Treasurer to the Leominster Guardians and Rural Sanitary Authority, *vice* Daggs, deceased.
- BOYER, Mr. John Frederick, has been elected a Member of the Hove Board of Improvement Commissioners and Urban Sanitary Authority, for the Medina Ward, *vice* Blandford, resigned.

- BROWN, Mr. John, has been appointed Surveyor and Inspectors of Nuisances to the East Grinstead Local Board and Sanitary Authority, at £60 and £40 per annum.
- BRYAN, Mr. F., has been appointed Inspector of Nuisances for the Amersham Rural Sanitary District at the rate of annum, *vice* Smith resigned.
- BUCHAN, Mr. John, has been appointed Surveyor to the Council and Urban Sanitary Authority of Great Grimsby, at £200 per annum, with the services of a Clerk, and 5 to take pupils, *vice* Maughan, appointed Consulting Engineer.
- BUTCHER, Mr. Frederick, has been appointed Treasurer to the newly-formed Chesham Local Board and Urban Sanitary Authority.
- COX, Mr. Henry, has been re-appointed Inspector of Nuisances to the Seaford Urban Sanitary District, at £20, for one year.
- DAWE, Mr. R. Hill, Solicitor, has been appointed Town Clerk to the Urban Sanitary Authority of Kingston-upon-Thames, Deputy Judge and Registrar of the Borough Court, and Steward of the Manor of Mytton, at £1,000 per annum, *vice* Todd, deceased.
- DE WORMS, The Baron George, has been elected a Member of the Hove Board of Improvement Commissioners and Urban Sanitary Authority, for the Adelaide Ward, *vice* Appach, resigned.
- DIXON, Mr. William, has been appointed Surveyor to the Improvement Commissioners and Urban Sanitary Authority of the City of London.
- ELDRIDGE, Mr. John, has been appointed Inspector of Nuisances to the Ryde Urban Sanitary District, at £65 per annum, *vice* Daish.
- EMMERSON, William Lindsay, M.D.Aberd., L.R.C.P.Edin., has been re-appointed Public Analyst for the Borough of Deal, for one year.
- EYTON, Mr. Thomas Slaney, Banker, Shrewsbury, has been appointed Treasurer to the Ellesmere Guardians and Rural Sanitary Authority, *vice* Campbell.
- GEORGE, Mr. —, Builder, has been elected a Member of the South Board of Improvement Commissioners and Urban Sanitary Authority, *vice* Woollaston, resigned.
- GLITHERO, Mr. Henry, has been re-appointed Inspector of Nuisances for the Braintree Urban Sanitary District, upon the same terms as before.
- HARLAND, Mr. Robert Henry, has been appointed Public Analyst for the Greenwich District, at £100 per annum, *vice* deceased.
- HARVEY, Mr. Sidney, has been re-appointed Public Analyst for the Borough of Deal, for one year.
- HAWKINS, Mr. George, has been appointed Collector to the Urban Sanitary Authority, at £60 per annum, *vice* resigned (but who continues as Inspector of Nuisances per annum).
- HAYES, Mr. Patrick, has been elected Chairman of the Town Commissioners and Urban Sanitary Authority, *vice* resigned.
- HILL, Mr. T. S., has been appointed Clerk to the Trowbridge Board and Urban Sanitary Authority, at £90 per annum, *vice* Clark and Collins, resigned.
- HODSON, Mr. Enoch, has been elected a Member of the Walsley Local Board and Urban Sanitary Authority, *vice* Griffiths, resigned.
- HOLMES, Mr. Valentine Webb, Branch Manager of the Provincial Bank of England, has been appointed Treasurer to the Urban Sanitary Authority of Leominster, *vice* deceased.
- HOPE, Mr. James, has been re-appointed Inspector of Nuisances to the High Sub-District of the Longtown Rural Sanitary Authority, at £15 for one year.
- HOW, Mr. Frederick, has been appointed Clerk to the Local Board and Urban Sanitary Authority, at £50 for one year.
- ISHERWOOD, Mr. James, Solicitor, has been appointed Clerk to the Guardians and Rural Sanitary Authority, at annum as Clerk to the Guardians, and such further remuneration as Clerk to the Rural Sanitary Authority and Committees, as may be fixed annually, and fees as Officer, *vice* Woodcock, deceased.
- KING, Mr. John William, has been appointed Surveyor, Engineer, Inspector of Nuisances, and Collector, to the Improvement Commissioners and Urban Sanitary Authority, at £100 per annum, *vice* Dormer, resigned.
- KNOTT, Mr. Jesse, has been appointed Building and Inspector to the Failsforth Local Board and Urban Sanitary Authority, at £70 per annum, *vice* Allen.
- LEWIS, Mr. Thomas, has been elected a Member of the Local Board and Urban Sanitary Authority, *vice* resigned.
- LOVE, Mr. Alfred George, has been re-appointed Inspector of Nuisances for the Beccles Urban Sanitary District, for one year.
- LOWNDES, Mr. William, has been elected Chairman of the newly-formed Chesham Local Board and Urban Sanitary Authority.
- MUNDAY, Mr. R. W., has been re-appointed Inspector of Nuisances for the Buckingham Rural Sanitary District, at £45, *vice* deceased.
- PURNELL, Mr. E. J., jun., has been appointed Surveyor to the Kenilworth Local Board and Urban Sanitary Authority, *vice* Hillier, whose appointment has expired.
- RAMSDEN, Mr. Arthur, has been appointed Surveyor to the Local Board and Urban Sanitary Authority at £500 per annum, rising to £600, *vice* Strachan, resigned.
- RUSTON, Mr. William, Solicitor, has been appointed Clerk to the Twickenham Local Board and Urban Sanitary Authority, *vice* Mr. William Ruston, senior, deceased.

in, Solicitor, has been appointed Clerk to the newly formed Local Board and Urban Sanitary Authority, at £30 per annum.

Mr. Martin, has been re-appointed Inspector of the Low Sub-District of the Longtown Rural District, at £30 for one year.

George Nelson, Solicitor, has been appointed Clerk to the Guardians, Rural Sanitary Authority, Assessment and School Attendance Committee, *vice* Mr. John (other), deceased.

Mr. Wis, has been appointed Collector to the Margam and Urban Sanitary Authority, Glamorganshire, at £100 per annum.

Mr. Men, has been elected a Member of the Wednesfield and Urban Sanitary Authority, *vice* Mr. John (other), deceased.

Mr. George, has been re-appointed Inspector of Nuisances upon Trent Rural Sanitary District, at £200 for one year.

Mr. George, has been re-appointed Inspector of Nuisances upon Rural Sanitary District, at £400 per annum.

Edward, Solicitor, has been appointed Town Clerk of the Urban Sanitary Authority of Totnes, at £70 per annum. Presswell, resigned.

VACANCIES.

MR. OF HEALTH for the Sheffield Urban Sanitary Authority, at £100 per annum. Application, January 7, to John (other), Clerk.

MR. OF HEALTH for the Cheltenham Urban Sanitary Authority, at £100 per annum. Application, January 10, to the Town Clerk.

MR. OF HEALTH for the Ormskirk Rural Sanitary Authority, at £250 per annum, rising £50 each year, to January 17th inst., to William Parr, Clerk to the Authority.

MR. OF HEALTH for the Alderbury Rural Sanitary Authority, at £100 per annum, probably for one year only. Application, January 10, to Francis Hodding, Clerk, Salisbury.

MR. OF HEALTH for the Market Harborough Rural Sanitary Authority, at £100 per annum.

MR. OF HEALTH for the Llanelly Sub-district of the Rural Sanitary District, at £30 per annum (in addition to fees as District Poor Law Medical Officer), January 10, to Thomas Price, Clerk to the Authority.

MR. OF HEALTH, CLERK, SURVEYOR, INSPECTOR OF NUISANCES, and COLLECTOR to the newly-formed Local Board and Urban Sanitary Authority. Application, January 10, to Thomas Price, Clerk to the Authority.

MR. OF HEALTH, CLERK, SURVEYOR, INSPECTOR OF NUISANCES, and COLLECTOR to the newly-formed Local Board and Urban Sanitary Authority. Application, January 10, to Thomas Price, Clerk to the Authority.

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MR. OF HEALTH, CLERK, SURVEYOR, INSPECTOR OF NUISANCES, and COLLECTOR to the newly-formed Local Board and Urban Sanitary Authority. Application, January 10, to Thomas Price, Clerk to the Authority.

LOCAL INTELLIGENCE.

LOCAL BOARD AND URBAN SANITARY AUTHORITY. The Members have resulted in the return of Messrs. 1327 votes: Hugh Williams, 262; Hugh Frytherch, 201; Robert Williams, 204; John Jones, 197; Davies, 193; John Morgan, 189; Hugh Ellis, 166.

THOMAS WRIGHT.—At a meeting of the Town Sanitary Authority of Cheltenham, on the 6th inst., the Mayor, moved the following resolution: 'That the Mayor, moved the following resolution: the family of the late Dr. Wright, Medical Officer at the Council desire to record their very profound regret at the loss of so able, devoted, and valuable a member of the Council, and the Council beg to assure the family of the deceased gentleman of their sincere sympathy with them in their affliction, an affliction which the Council trust may be lightened by recollections of the useful life passed by their parent, and the distinguished position attained by him in the scientific world.' The resolution was carried *unanimously*, a copy to be forwarded to the deceased's family.

MR. J. Carr Bottomley, ex-Chairman of the Brighouse Local Board and Urban Sanitary Authority, has been presented with a Portrait of himself and a Silver Loving-cup, by the Members of the Board, in appreciation of his services and as a memento of respect, and entertained at a dinner. Mr. Henry Sugden, the present Chairman presided, and all the Members of the Board, and Mr. James Parkinson, the Clerk, were present. Both presentations were made by Mr. Sugden; the Portrait privately, and the Loving-cup, upon proposing Mr. Bottomley's health, after the dinner.

THE FARNHAM LOCAL BOARD AND URBAN SANITARY AUTHORITY have increased the salary of Mr. R. Mason, the Clerk, from £50 to £100 per annum, and that of Mr. Richard Hawkins, the Surveyor, from £100 to £120 per annum.

THE VESTRY of the Parish of St. Marylebone have increased the salary of Mr. Alexander Wynter Blyth, the Medical Officer of Health and Public Analyst, from £400 to £500 per annum.

WE made a few observations in our last (p. 246) upon the conflict of authority between the Amersham Rural Sanitary Authority and the Local Government Board as to the medical officership of health. Mr. Hosegood was appointed for the year ending Sept. 29, 1884, and duly confirmed by the Local Government Board. He was then re-appointed for another year, but the Local Government Board declined to confirm 'for the present,' simply, we believe, because he did not reside within the district. Another gentleman has now been appointed, and Mr. Hosegood has applied for payment of his salary for the three months during which he discharged the duties, and for a testimonial. The latter was directed to be given, but, with regard to the salary, the authority were 'afraid they had no power' to pay it. We say nothing in the least disparaging to the present medical officer; he is doubtless qualified for the office or he would not have been appointed to it, but he is a new comer (according to the 'Medical Directory' for the present year, he is, or was, residing at Kensington), a younger man, and only became qualified and registered in 1883, and without any experience as a medical officer of health. Mr. Hosegood, on the contrary, has actually held the office and fulfilled the duties to the satisfaction of everybody, the Local Government Board included, for fifteen months; but he is non-resident in the district, although close to it, and sufficiently near for all practical purposes, and hence he is to be deprived of his office and of payment for his services for the last three months. It does appear to be ungracious to a meritorious officer to draw the line so very close, and, at any rate, we cannot but feel that Mr. Hosegood, having been appointed by the authority, and performed his duties, must be entitled to the salary.

MANSFIELD IMPROVEMENT COMMISSIONERS AND URBAN SANITARY AUTHORITY.—At the annual election on the 8th ult., the following were elected for the ensuing three years, viz.:—Messrs. Ernest Harwood Greenhalgh, with 1,037 votes; Robert Barringer, with 1,009; John Watt, 880; Timothy Taylor, 858; Samuel Jepson, 834; Thomas Savage, 801.

THE EPSOM GUARDIANS AND RURAL SANITARY AUTHORITY recently reduced the salary of Mr. G. Mather, Inspector of Nuisances, from £255 to £155 per annum. He wrote to the Authority asking them to reconsider their decision, and the Rev. E. W. Northey, at the meeting on Oct. 15, moved (pursuant to notice) That they should do so; but after considerable discussion an amendment 'That the salary remain as it was,' was carried by nine to six.

DR. A. BOSTOCK HILL, the Public Analyst for the Borough of Royal Leamington Spa, in his last report, stated that no samples had been sent to him for analysis during the quarter. Upon a member, in some surprise, asking how this was, he was answered by the Inspector that he had received no complaints, whereupon the Report was passed as satisfactory. But it can scarcely be considered 'satisfactory' to the outside public, unless it can be inferred that the traders are immaculate, and never adulterate anything; it would rather evince total apathy upon the question of adulteration, and that 'The Sale of Food and Drugs Act' is a dead letter in the borough.

PRESENTATION TO MR. A. A. CORSELLIS, OF THE WANDSWORTH BOARD OF WORKS.—On Friday night, Nov. 28, Mr. A. A. Correllis, who has resigned the office of clerk to that board after twenty-nine years' service, was entertained at dinner in the 'Colonel' Saloon, Holborn Restaurant, by his brother officers. After the usual loyal toasts and 'The Board of Works' had been honoured, Mr. Barber, surveyor of Streatham and Tooting, and the oldest officer present (except Mr. Correllis himself) proposed the health of the guest of the evening. Mr. Barber referred to the enormous increase in the population and rateable value of the district since the appointment of Mr. Correllis, who was the first officer appointed under the Metropolitan Local Management Act of 1853. Not one of the original members of the board, and only one of the original officers, now remained in office. Mr. Barber referred to the valuable services Mr. Correllis had rendered, to his extensive knowledge of parochial law, his unflinching uprightness and upright and honourable character. Mr. Barber expressed his sincere regret at losing so esteemed a colleague, and requested his acceptance of a handsome silver inkstand subscribed for by his brother officers, and concluded by wishing him health and happiness in his retirement. The inkstand bore the inscription 'Presented to A. A. Correllis, Esq., by his brother officers of the Board of Works for the Wandsworth District, as a mark of their sincere regard and esteem, Nov. 28, 1884.' Mr. Correllis, in response, spoke of the kindly relations which had always existed among the officers of the board. The other toasts were 'The new Clerk to the Board,' proposed by Dr. Kempster, and responded to by Mr. H. G. Hills, who succeeds Mr. Correllis; 'The Sanitary Department,' 'The Surveyors,' 'The Clerical Department,' and 'The Visitors.'

The Romford Local Board and Urban Sanitary Authority have increased the salary of Mr. A. H. Hunt, their Clerk, from £50 to £100 per annum.

The Town Council and Urban Sanitary Authority of Gravesend have increased the salary of Mr. Arthur Henry Lukes, the Inspector of Nuisances, from £25 to £40 per annum.

John Byrne, of Shellborne Road, Dublin, was fined 40s. at the Northern Police Courts, on Nov. 25, for refusing to sell a pennyworth of milk to Inspector J. Madden on Oct. 21, for analysis.

At a public meeting at the Lecture Hall, Penzance, Mr. R. R. Victor, J.P., the Mayor, in the chair, it was unanimously resolved to purchase the site of the Coastguard Station, and to establish public baths.

The Loughborough Local Board and Urban Sanitary Authority have increased the salary of Mr. John Newman, the Collector, from £70 to £90 per annum.

The Finchley Local Board and Urban Sanitary Authority have voted £175 to Mr. G. W. Brumell, C.E., their Surveyor, for services in connection with the scheme of sewerage devised by him, and increased his salary from £130 to £180 per annum.

The Reigate Town Council and Urban Sanitary Authority have added £25 per annum to the salary of Mr. J. H. Apted, the Collector.

NOTES AND QUERIES.

Having for some time back been in the receipt of Queries appertaining strictly to sanitary work, and which it would be easy to answer, without having to refer our correspondent to competent professional advisers, we have opened a column in which to register such Queries and Replies thereto as can fairly be expected from us; and our subscribers and readers are invited to make such use of this column as will tend to benefit themselves and the community. Both Queries and Replies will, however, be subjected, if unnecessarily long, to a strict curtailment.

136. DUTY OF MEDICAL OFFICER OF HEALTH AS TO BARRACKS. I shall be obliged if you will inform me whether it is the duty of a medical officer of health to inspect the barracks in his district. I ask the question because I was recently refused admission to some barracks, which had been visited with an outbreak of enteric fever?

CIVIS NON MILES.

[The Local Government Board do not consider it necessary that these places should be visited by local sanitary officials. In regard to demanding admission thereto, see sect. 327 (2) of the Public Health Act, 1875, which provides that 'Nothing in this Act shall be construed to authorise any local authority to disturb or interfere with any lands or other property vested in the Lord High Admiral of the United Kingdom or . . . in Her Majesty's Principal Secretary of State for the War Department for the time being.' It is doubtful, therefore, whether a medical officer of health, in virtue of his office as such, is empowered to seek admission to barracks.—En.]

137. COMPENSATION UNDER ARTISANS' DWELLINGS ACTS.

A good deal is said about the 'extravagant cost of compensation' as a sort of excuse for the delays of the Metropolitan Board of Works and other authorities in exercising their powers under the various Acts passed for the improvement of artisans' dwellings. My impression is that recent legislation has tended to pare the claws of the rascally proprietors of tumble-down houses who are so ravenous for 'compensation.' Is this so?

CURIOSUS.

[By sect. 3 of the Artisans' Dwellings Act of 1879 (42 and 43 Vict., c. 63) the amount of compensation payable under any scheme was considerably diminished in cases where the houses or premises proposed to be taken could be proved to the arbitrator to have been at any time between the date of the official representation and that of the confirming Act a nuisance within the meaning of the Public Health Act, 1875, and any local Act which contained any provisions with respect to nuisances in the district. The Act of 1882 (45 and 46 Vict., c. 54) simplified very considerably the procedure for determining the compensation to be paid for lands acquired under the Act of 1875. The most important alterations were—the abolition of the provisional award of the arbitrator, and the increase from 500*l.* to 1,000*l.* of the amount which the compensation must exceed to enable a person to appeal to a jury against the amount awarded.]

138. QUALIFICATIONS OF PUBLIC ANALYST.

Kindly refer me to any Act of Parliament or official order which prescribes the qualifications required for the post of public analyst.

CANDIDATE.

[No qualifications are absolutely requisite; but the Food and Drugs Act of 1875 gave express power to the Local Government Board to require, in the case of any future appointment of analyst, satisfactory proof of his competency; and that Board invariably demand evidence of the candidate's possessing some analytical qualification, or of his having attended with credit a course of instruction in qualitative and quantitative analysis. The Act further provided that no analyst was to be appointed for any place in which he was engaged, either directly or indirectly, in any trade or business connected with the sale of food or drugs. Sect. 11 empowered the town council of any borough to engage the services of the analyst for the county or any neighbouring borough.]

139. MELKSHAM, R.S.A. v. THOMAS.

I am not surprised that a question should be asked in your *Queries* about the failure of justice in the above mentioned on p. 123 in the September number.

It is very evident that there were three nuisances, and these to be dealt with in three different ways—(1) In the case of water supply, a second notice should have been given under of the Public Health (Water) Act, 1878; (2) in the case of drain, if the authority's orders (so far as they could be given) were not complied with, the inspector should have orders to do the work properly, and recover the cost by proceedings; and (3) in the case of the sewage hole, a should have been taken out before justices for the abatement nuisance. The two latter cases certainly needed no second If the Melksham authority put all these matters into one same set of proceedings it is not to be wondered at that it in procuring a conviction. This is only an every day in the absurdly complex working of the Public Health Act not at all unusual to find these nuisances and defects e the same premises. I have this day met with a case similar. This multiplicity of processes raises needless ob the way of gaining the desired end—and that speedily rectification of unwholesome premises, and it is much to b in any amendment of the Public Health Act that may b plated, that a greater simplicity may be arrived at in proceedings necessary for the suppression of nuisances.

I can, however, hardly believe that the case has been reported. If it has, the worthy justices have not sho legal acumen in giving such absurd reasons for their They should be advised for the future to give their without any comment.

It is very desirable that such matters as these should be giv widely-circulating journal, as they tend much to the int those whose lot it is to conduct legal proceedings in questions.

Will the Melksham sanitary inspector throw some clear this question?

ORDINANCES OF THE PLUMBERS.

THE following 'Ordinances of the Plumbers,' tal 'Revived Guild Action,' by Mr. George Shaw published in 1878, will be read with interest in con with the report of the Plumbers' Congress in the SA RECORD for Nov. 15, 1884.

38 Edward 3rd, A.D. 1365. *Letter Book E (Norman-French.)*

'May it please the honourable man and wise, the Mayor, I and Aldermen of the City of London, to grant unto the Pl the same City the points that here follow:—

'In the first place, that no one of the trade of Plum meddle with works touching such trade within the said Cit house or apprentices, or other workmen, in the same, if he l of the City; and that, by assent of the best and most skill the said trade, testifying that he knows how well and lawfull and to do his work; that so the said trade may not be scand the commonalty damaged and deceived, by folks who do not l trade.

'Also, that no one of the said Trade shall take an apprenti than seven years; and that he shall have him enrolled withi year, and at the end of his term shall make him take up his according to the usage of the said City.

'Also, that every one of the Trade shall do his work wel fully, and shall use lawful weights, as well in selling as i without any deceit or evil intent against anyone; and that fo a clove of lead for gutters, or for roofs of houses, he shall one halfpenny; and for working a clove for furnaces, *leaf* belfreys, and conduit pipes, one penny; and for the waste o lead when newly molten [he shall have an allowance of tw as has been the usage heretofore.

'Also, that no one for singular profit shall engros lead the said City for sale, to the damage of the commonalty; b persons of the said Trade, as well poor as rich, who may l be partners therein at their desire. And that no one, him another, shall buy old lead that is on sale, or shall be, withi City or without, to sell it again to the folks of the same l enhance the price of lead, to the damage of the commonalt

'Also, that no one of the said trade shall buy stripped le assistants to tilers, *laggers*, or masons, or of women who c warranty for the same. And if any shall do so, himself servants, or if any one of them be found stealing lead, tin in the place where he works, he shall be ousted from the l for ever, at the will and ordinance of the good folks of such

'Also, that no one of the said trade shall oust another work undertaken or begun, or shall take away his custom employers to his damage, by enticement through carpenters, tilers, or other persons, as he would answer for the damg inflicted, by good consideration of the masters of the said trad

'And if any one shall be found guilty under any o Articles aforesaid, let him pay to the Chamber of the Gui London, for the first offence, 40 pence; for the second, half for the third, 20 shillings; and for the fourth, 20 pounds forswear the trade.'

ORIGINAL PAPERS.

**SYSTEMS OF HEATING WATER
SYSTEMS OF HOUSES FOR
THE USE OF HOT WATER THERE,
ALSO HOT WATER FOR UP-
PER PURPOSES.***

By W. EASSIE, C.E.

A house requires a supply of hot water for domestic purposes, then all incomes require the same, and I would even say that a cottage tenement is not complete without some sort of a hot-water supply. How so, then, houses of the wealthier classes? A cottager requires a supply of water at his hand wherefrom he can draw hot water for a bath, and always for cooking purposes without having to boil the water in a kettle over the kitchen fire. I have been tempted to make this subject because I have often, in the houses in London, found the house supplied with hot water by a sole hot-water draw-off at the kitchen jamb, and whenever hot water was required upstairs, the domestics had to climb up four or five flights of stairs. If operated, then this lecture will prove useless. I am sure all will agree in thinking that a house is not thoroughly equipped, or the interests of the family or the domestics are neglected. Certainly the health of the inmates, even the sanitary condition of the house, is aided for in such a case, for a bath-room and water ablution is often a matter of life and death, especially on the nursery floor, and I intend that unless there be an adequate supply of hot water to the housemaids' sinks upstairs, for the cleansing of the floors and woodwork is not efficiently performed. For we know that if the housemaids have to mount a hundred or so of backstairs steps some eight feet high, with their concomitant ugly winders, the floors will be 'more honoured in the dust than in the observance,' and hot water will be taken into the nursery by dint of a discipline on the part of the lady of the house. I know cases of servant girls who died from consumption, due to the incessant climbing caused by frequently carrying up daily to the bed chambers of a numerous family. Most amusing and distressing, if the two systems of mind can be associated, to visit a house with its simple draw-off tap at the kitchen and to notice behind the kitchen fire a boiler of forty or fifty gallons capacity, heated by a gas range, with a tolerably furious fire, when, at a little cost, the same fire could be used to supply upstairs baths, lavatories and any of the three systems which I shall discuss this evening.

I doubt that there are householders who do not know the hot water circulating upstairs, owing to the frequency of boiler explosions in the kitchen, but due to want of knowledge, inasmuch as a managed hot-water supply is no more

dangerous than having none at all, provided that the hot-water supply is carried out on sound principles, and fixed by responsible hands.

The system upon which all circulating systems are based, is the exchanging of the water between the boiler behind the kitchen fire and the cistern, by means of flow and return-pipes, working in conjunction with a hot-water 'mixer.' Even with the worst form of boiler which circulates water, the pressure from the head of water is never great, and all will go well until incrustation, interposed foreign matter, or frost intervenes. In such cases the circulation is prevented, the pressure is continually increasing in the boiler, and, if the fire be very fierce, the resistance of the boiler will be mastered; and, as a rule, the thicker the boiler the greater the explosion, for the boiler generally gives way before the pipes.

The greatest culmination of disasters recorded in the press due to household boiler explosion occurred at the end of 1878. And both before and after that date, were the statistics of fatal cases obtained, to say nothing of maimings for the remainder of life, the figures would be truly appalling. It would be a waste of time to enumerate the details of any of such cases, because they are of yearly occurrence and reported in the newspapers. The cause of such explosions is commonly attributed (and, I think with Mr. Fletcher, erroneously) to the flowing into a heated boiler of a quantity of cold water. Steam thus generated might, I think, fracture the boiler; but the true cause of explosions is due to the constantly accumulating heat in the boiler, which, when it reaches a certain ungovernable power, overcomes the plates or joints of the boiler. In making these few preliminary remarks, I may say that I am perfectly aware that a properly constructed safety or escape valve, limited to a certain resistance, would prove efficacious and save many scores of lives. But there really is so much carelessness in the making and fixing of these valves that some better system—more worthy of the age, and meeting every probability full in the face—should be matured, until accident becomes more or less impossible.

There are, commonly speaking, three systems of heating water for domestic purposes; and for sake of convenience I would term them the single boiler with flow and return from the back of the kitchen fire, the circulating system with flow and return from the circulating cistern (the latter being placed at the top of the house), and the cylinder system, with the hot-water circulating cistern level, or nearly so, with the boiler, and thus obviating the necessity of a hot-water reservoir upstairs.

The time allotted to me would be altogether insufficient to afford in any detail an explanation of wherein the three systems agreed or differed. I think that I will therefore confine myself to the three methods of supplying hot water for domestic purposes, which are exhibited upon the diagrams which illustrate my lecture. The advantages of hot-water heating might take the forms of the degrees of comparison exhibited by an adjective—the positive, the comparative, and the superlative.

I would place the single boiler system, with its only reservoir in the boiler, in the first degree, shown on Plan 1, as the most primitive and also the most dangerous. I would place the upstairs circulating cistern, shown on Plan 2, in the comparative degree, because it possesses advantages over the single boiler which forms the whole and only reservoir. I would place the cylinder system, shown on Plan 3,

M M

*Lecture before the members of the Parkes Museum, Dec. 11, 1884.
Chesham, F.R.S., in the chair.

as the outcome that is most feasible and best for hot-water heating for domestic purposes.

There are many differences in each of these systems, but it would amount to a farce to attempt to record them. It would be sufficient to say that all these systems suffer either from the diversity of ideas in the minds of the manufacturers, in the more or less insane wish to so alter a previous patent that it shall become ostensibly a different article, or from other motives, the metaphysics of which can only be registered in the High Court of Conscience.

Before proceeding to explain the three systems of heating water which I have chosen as mainly conducive to its due service in the economy of the house, I should like to remark that I do not seek for one moment to discriminate or make any invidious comparison between any of the systems now in use, and I determined upon this owing to the fact that sundry arrangements have notable advantages, and divers others more or less improvements of another sort which effect the objects in view.

The first system for heating water for potable or other uses, is that exhibited on plan No. 1, but it must be understood that in making choice of this example I am in no way forgetful of the many complications which are involved in the system in question.

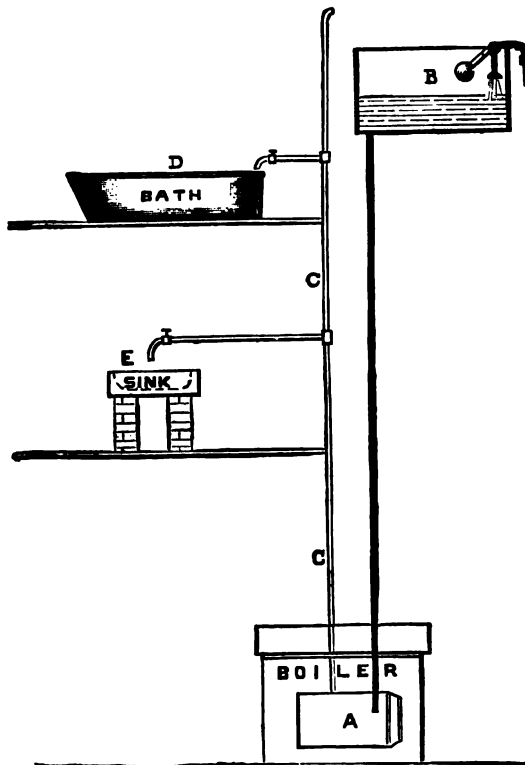


FIG. 1.

Here, as may be seen, the boiler is situated at A, behind the kitchen fire, and the water, as it is derived from the cold-water cistern B, ascends the pipe C, and delivers its hot water into the bath D, or at the sink E. The faults of this system are obvious. First of all, there is no circulating cistern, either upstairs or downstairs, consequently the water in the boiler is allowed, unless frequently drawn, to boil and bubble up the expansion pipe F. It will easily be seen, that

supposing a bath were required at D twice in immediate succession, the boiler A would not be able to supply it, and the sink E would suffer, which is a decided drawback to the system. But, irrespective of this, and I will merely notice it in passing by, there is a danger possibly resulting from the boiler A being robbed of its water by the action of the ball-cock in the cistern B being stuck in its place, or by the freezing of a paucity of water in the same cistern. The result and danger can easily be imagined. This system was doubtless an acquisition in its time, and has served its purpose, but it is to be lamented that impecunious people still continue to erect them in connection especially with buildings of the speculative order.

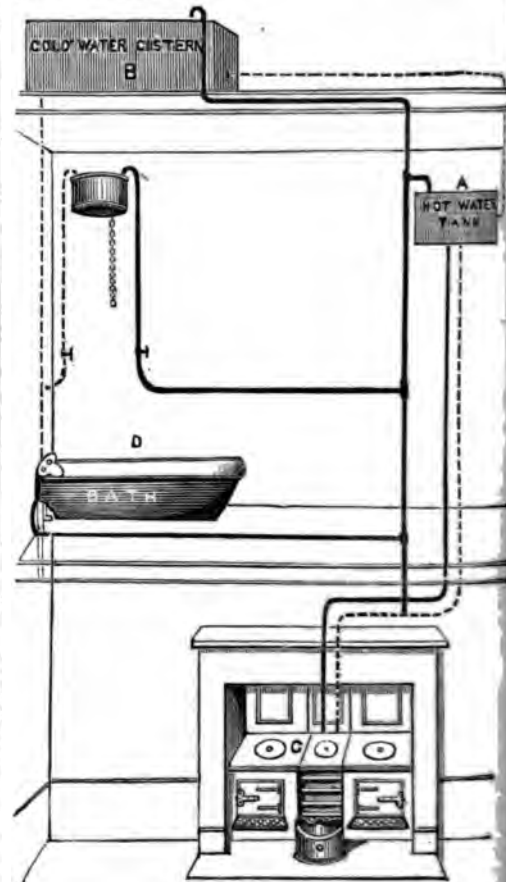


FIG. 2.

On Plan 2 I have endeavoured to show an improvement upon the system, which comprises the necessity of a hot-water circulating cistern at the top of the house, in contradistinction to the want of a hot-water circulating cistern at all. The plan does not exhibit many of the characteristics of this method of heating water, because, as will here be seen, there is no feed cistern in connection with the hot-water cistern at A, and the cold water flows direct from the cold-water cistern at B into the circulating system and down into the boiler, behind the kitchen fire at C. This plan of Messrs. Stephens Brothers doubtless possesses some advantages over the more commonly practised methods for heating water for upstairs draw-off

s, but it has disadvantages as well. This plan must be taken, not as representing the complete system of the devisers, but it may be taken to exhibit some of the drawbacks which generally accompany a system of hot-water heating, the pronouncement of which is situated upstairs. For example, if the bath drawn at D was a housemaid's draw-off sink, where once a day, but ten times a day a supply were needed, the cold water would have first of all to be drawn off before the hot water arrived, owing to the nature of the establishment of a thorough system of circulation. I have already alluded to the possibilities of danger which surround hot-water heating, fitting for a favourable moment for development. There are systems of hot-water heating, the derivations of which are situated far above the boiler, but I think that my readers will not care to be troubled with any description of these.

It is hardly conceivable that builders could be so silly as to imagine the worst forms of circulating systems, and actually conjoin the supply cistern by a mere diaphragm of zinc. Of course, this is mere sloppiness, done for cheapness, and the case is not proved when I state that the cisterns were not varnished or lead-lined, but of common brickwork painted inside. The entry from the cold-water cistern into the hot-water one, was by a small aperture at the base of the zinc division, and it can only be conceived that the cold water was mostly and the hot water mostly cold.

And here, by way of interpolation, I might mention a very curious circumstance that if responsible men are asked to conduct hot-water pipes up to higher storeys of a house, it is twenty chances to one that they will take the cold and hot water in closest clustering proximity. In other words, simply because there is an available chase in wall, they bring the water from the upstairs cold-water cistern down to the housemaid's sinks, jammed closely against the flow and return of the hot-water system. In summer, therefore, when a cold refreshing drink of water would be grateful, it can be found, upon drawing it off, that it is just sufficiently lukewarm to act as an emetic.

In contradistinction to the systems of heating hot water for domestic purposes which has obtained in England for a very long time, with their corresponding disadvantages, I would like to explain what I consider are some points of vantage in the heating system introduced into England from America, namely by Mr. F. Dyer, of Camden Town, in 1868. It must be understood, however, that improvements resulted mainly from the introduction of the cylinder system as opposed to the circulating cistern in the rear part of the house, which I have endeavoured to explain in the former part of my lecture.

Take, for example, fig. 1, which exhibits the salient points of the system which I reprehend. There are all evils concomitant with heating water at a high level have been hinted at with their attendant dangers. The system which I beg to offer a few observations on is known in America as the cylinder system, and is opposed *in toto* to the method of heating water for draw-off purposes as extant in England and in various parts of the Continent.

I have explained in detail the system of heating water for domestic supply when that has been connected upon the upstairs circulating cistern, either in one way or the other, and I will now endeavour to explain the procedure when dealing with what I would prefer to call the rational system of hot-water

supply; so begin with the boiler, which is, after all, the parent of all hot-water heating. It is quite a mistake to fancy that it is necessary to have a boiler of large internal capacity. The truth is, that where the water is soft—and this obtains over a great portion of the country—a few pipes of an average internal sectional area of an inch, measuring altogether about 6 feet, and placed at the back of the fire, boiler-fashion, with a slight space between the pipes and the back of the range, with a slightly widened base of the cinder-space, will suffice. This cinder-space is also so contrived that the clinkers can be easily cleaned out, and bear in mind that clinkers form the veritable curses of hot-water heating. There is this advantage in a boiler formed of small interlaced tubular pipes, that clinkers do not get leave to form in point of time, as the intense radiated heat dislodges them.

In cases where hard waters are prevalent the pipe form of boiler is not applicable, owing to the speedy formation of carbonate of lime in the pipes. The ordinary form of boilers must then be selected, and, preferably the saddle-boiler for ordinary work would be found best, but this remark must be taken with caution, because it has always been found expedient in large mansions and public buildings where great quantities of hot water are used, to make use of such a boiler as the tubular flued boot boiler, for evident reasons of superior yielding of boiling water.

In the system of hot-water heating represented by fig. 3, advantage is taken of an acknowledged idea that means should be accorded whereby the boiler can be cleaned out of any internal impurities. It is not uncommon to find scores of boilers where such a necessity is perfunctorily provided for, but in such cases the emptying of the boiler will simply be by a draw-off tap at the side of the jamb.

Sometimes, unwisely, this draw-off tap is taken from the base of the boiler, in which case there is a possibility of accruing danger, owing to the heating of the boiler and the absence of cold water in the cistern. With a little more wisdom the draw-off tap here has been made at such a point as not to totally empty the boiler.

A glance at fig. 3 will show that the sluice-cock at A would empty both boiler and cylinder and the whole system of circulating pipes, and it would be, of course, a matter of the utmost importance that the delivery of the empties of the pipes and boiler should be disconnectedly into an open drain.

I might here point out the advantage which accrues from having a stop-cock placed immediately underneath the cold-water cistern at the top of the house which supplies the apparatus, so as to be able to control the delivery of the water to cylinder and pipes alike. This is a matter which is very rarely observed, to the great detriment of the household, for not only is there a possible contingency of causing an explosion in the boiler, but the water is emptied from the cistern without any possible advantage.

I will remark hereafter that there are several cylinder systems extant, both in America and England, but I have chosen the one represented at fig. 3 as being the best adapted to supply all the wants of a household without complication. Looked at from a broad point of view, the cylinder system by the side of the boiler or heating apparatus clashes entirely with the system of which the hot-water circulating cistern is the example. I do not for a moment seek to infer that, with due precautions at

all times manifest, the upstairs hot-water circulating cistern will not perform adequate duty, but I would

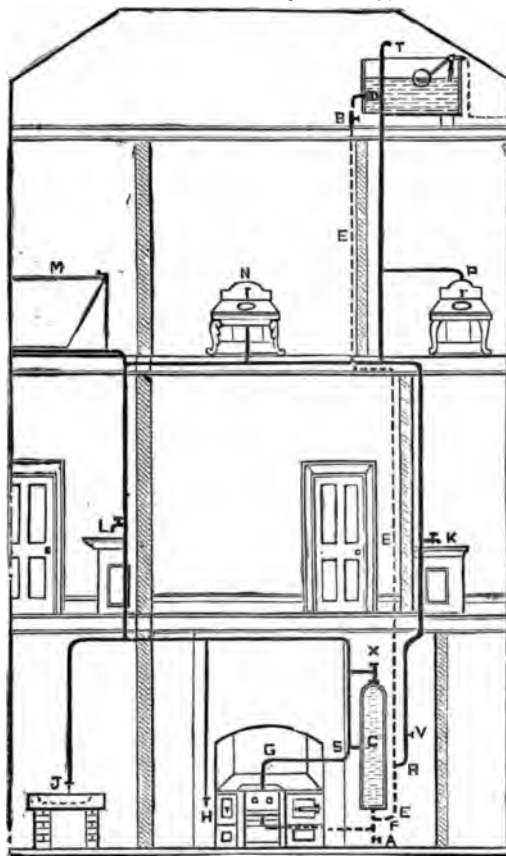


FIG. 3.

contend that all should claim to be possessed of an apparatus which is free from objections, and especially from those evils which result from careless management. I will not here reiterate a single word upon the disadvantages of the upstairs hot-water circulating cistern, because I have mentioned them in a former part of the paper, and I may add here parenthetically that in drawing attention to the relative merits of systems 1, 2, and 3, I have no interest in one system or another.

In the cylinder system, as I call it, every ounce of water is heated in the cylinder, which is shown at C, and the cold-water supply is derived from the cistern E, and flows by way of the pipe F, and enters the cylinder at the bottom at F.

As the water is heated in the boiler G, it delivers itself into the middle of the cylinder C, and thence, as in the case of the diagram, supplies the kitchen jamb H, and the scullery-sink J, the housemaid's sink K, the lavatory L, the bath M, the wash-basins N and P. It will thus be seen that as the water is heated it ascends through every ramification of the pipe, and, after it has supplied every draw-off, it joins the cold-water down pipe to the cylinder at the point R, thus enforcing a constant circulation. Between the point G, which represents the boiler, and the point S, the pipes are enlarged in size to $1\frac{1}{2}$ inches diameter, and above the point S to all the draw-offs the pipes are reduced in size—the intention being by the enlargement between the boiler G

and S to allow a certain portion of the heat to act as a reserve in the cylinder, while at time retaining the natural circulation in the

Vexing is it beyond measure to the householder find many times, with an incomplete system of circulation, that he has to open the hot-water sometimes draw off a gallon or so of cold water according to the length of the service, before hot water is available, and should he then draw hot water off again, he would find a disability in the hot-water supply, owing to cooling of the pipes. By the system of continuous circulation, shown on Plan 3, this drawback is avoided. Of course this continuous circulation is not achieved with any apparatus, and I only mention it here because it occurs in sequence.

I may here interpolate that in common systems of hot-water heating an expansion tank is carried up, and delivers either on to the top of the cistern, or above the level of the cistern. It should be taken at all events to some place sufficiently high over the hot-water cistern, and it is not a wise thing to deliver any cold water into the cold-water cistern.

There is one advantage which the cylinder system possesses over all others, and that is the retention of hot water in the cylinder, when the circulation has been shut off, by actuating the valve beside the cylinder. The effect of this is to keep the circulation during the night, when the fire is supposed to be extinguished; and, this being the case, hot water in the cylinder would remain at a considerable temperature, and enable an early supply to be supplied with comparatively hot water before servants have lighted the kitchen fire. In sickness or sudden illness in the household the effect of this would be evident. Another advantage of this is that the water in the cylinder has time to cool, owing to its non-circulation during the night, and that a very little supply of fuel in the kitchen boiler and the unclosing of the valve would speedily supply hot water to all the rooms before alluded to. Supposing that the circulation which stops the circulation at night so as to save hot water in the morning before the fire is lit was omitted to be opened again by the servant, the worst of all that could happen would be that it would necessitate the drawing off of a considerable amount of cold water before the hot water would arrive, and this would suggest to the servant that they had forgotten to turn on the valve V.

I ought perhaps to have pointed out before, but unlike some other cylinder systems which are in the market, it is perfectly impossible to draw the whole of the water in such a cylinder as this, owing to its being placed so close to the floor, and to its construction, whereby it can be seen to be impossible to empty it except by means of a sluice. For instance, the whole of the hot water in this case is derived from the top of the cylinder, and will be seen at the kitchen-jamb H and the scullery-sink J. And even supposing that a downstairs tap or cellar-tap was required to be supplied with hot water, this tap would also be derived from the top of the cylinder. It can easily be seen, therefore, that the boiler, from the mere fact that the cylinder is full, or nearly so, can never be placed in jeopardy, and weeks might elapse before danger could possibly accrue, even provided the ordinary carekeeper of a house ignorant of the system was left in full charge.

der heating of water of this kind it might from the foregoing remarks that extra pressure hardly necessary, but the system in which I have been explaining lends itself a facility to the employment of what is called a safety valve. Such an apparatus is not used, but in no case in which I have seen it used has this precaution been discovered necessary, and it rather appertains to the best forms of hot-water supply.

It is very advantageous in a household to have a system of what are called hot-water circulating for the purpose of heating a room, a hall, a nursery, a bath room, or a linen room. The system of heating from the upstairs circulating is capable of performing this service, but with drawbacks. For instance, supposing a conservatory to be heated on an upper floor, the stopcock would be to stop the circulation of the water by a T-piece, and cause that hot water to go through the conservatory coils and on to the water cistern. But supposing the servant with cocks in connection with the conservatory apparatus—viz., the supply through the conservatory and the by-pass as well—instead of the stopcock or the other open as required, the consequence might be serious, especially when there is a circulating cistern and only the boiler.

Difficulties connected with the hot-water circulating cistern upstairs, when in conjunction with the coil between the hot-water circulating and the boiler, is obviated by the use of a stopcock.

For granted that the stop-cock was shut off, ascension or flow-pipe, there would still be circulation between the boiler, the circulating cylinder, and the stop-cock, and as the water could be always supplied with cold water, the water became over-heated all that would be that the ring of metal on the safety valve would be lifted up, and the up-pressing water would flow off, and be instantly supplied with cold water. In cylinder systems, however, of modern construction even temporary inconvenience is obviated, as a separate flow and return is taken in connection with the hot-water ascension pipe, and the back with the return, so that it would not matter whether the stop-cock in connection with the pen or closed, as the circulation would go on the same.

In America two cylinders have been heated from one boiler, belonging to two tenements, and this has been a difficult matter; but there it sometimes happens that there is no necessity for a separate supply beyond a lavatory above the boiler, in which case it would be unnecessary to run pipes up to the ceilings above the ground-floor again to the ground-floor level. The system is therefore made in some cases to work in connection with pipes laid underground the boiler, and the *Sanitary Engineer of New York* has some very interesting cases of how this is

it may be taken for granted, although it is a question, that the cylinder system has an advantage over what our Trans-Atlantic brethren use in the English system. They argue that, the more the boiler is from the cylinder the more is the risk, and the greater the expense in the cylinder, even with the temperature at zero, the cylinder out of doors, and run it with safety for days, provided that the fires be

constantly kept up, and a proper safety valve provided. We can depend upon one thing, and that is, that the Americans thoroughly understand our English system of heating water for domestic purposes, and that they have deliberately rejected it, and have chosen the only system which is free from danger in their country where severe frost prevails. But this is only an additional reason why the cylinder should be adopted in England for the household, seeing that our household boiler explosions mainly result from our own much less severe frosts.

Since the first introduction of the cylinder into England of the kind which is shown at C on diagram No. 3, many various adaptations of the principle have been introduced by the English manufacturers, and different metals are used, but I do not here desire to enter into the inferiority or superiority of any one of them. I would only point out that not all the English makers recognise the value of the true cylinder, for some of them by placing the cylinder near the ceiling of the kitchen, and sometimes higher still, render it possible for the cylinder to be emptied at the lowest sink. They may make use of a cylinder, but this is not the cylinder system which I have been trying to explain in plan No. 3. For if the lowest sink or kitchen jamb draw-off empties the cylinder and there be a frozen pipe or stuck ballcock in the upstairs cistern, there is no difference between such a cylinder, and a hot-water circulating cistern upstairs. The true cylinder system, in my opinion, is shown at Plan 3, because that cylinder, where placed, can never be emptied, except by the sluice-cock A, forasmuch as the hot water is drawn off from the top of the cylinder.

If it can be proved that the hot-water circulating cistern, shown on Plan 2, is the best suited for this country, it will certainly prevail. But it seems curious to me, if this is the case, why so many more or less copies of the cylinder system exist amongst us. And it strikes me as curious, also, that I have never heard of any American house fitted up on the English principles; and it must be borne in mind that it has been stated by the best authorities that there are more domestic boilers for domestic purposes in New York State than there are in the whole of Great Britain.

I hope it may be my pleasing duty to listen in turn to a series of lectures upon this very interesting subject, which is so nearly allied to sanitary work. Without depreciating the City and Guilds of London Plumbers' competitions of which I happen to be the examiner, I would say that I regard it as a great pity that in the olden times there was no ancient Guild of Hot-water Heaters. Surely, however, now is the time, either to found a separate branch of technical education, or to join with the Worshipful Company of Plumbers, and give the public the best advice upon the subject of heating water for domestic purposes, seeing that the plumber must be often the sole hot-water engineer.

THE Worshipful Company of Fishmongers have granted a donation of £20 to the National Health Society, 44 Berners Street, W., for the diffusion of sanitary knowledge.

HER MAJESTY THE QUEEN has been graciously pleased to present to the funds of the Booksellers' Provident Institution, through Sir Henry Ponsonby, K.C.B., a donation of £20. Her Majesty has been patron of the Society since the year 1868.

THE SUPERVISION OF OFFENSIVE TRADES.

By ALFRED SPENCER,

Chief Officer, Special Purposes and Sanitary Branch, Metropolitan Board of Works.

THE diminution and prevention of nuisances arising in trade processes are objects which have always demanded the attention of sanitary reformers, and in recent years, from a variety of causes, the necessity for such attention has undoubtedly increased. Science has from time to time revealed the commercial value of much that was formerly looked upon as waste or refuse, and in utilising such refuse many new processes have been developed, which have increased the number and variety of the effluvium nuisances from offensive trades. I do not think there is now much difference of opinion on the general question of the necessity for regulating such trades, to the extent of requiring the observance of reasonable precautions for preventing public nuisance in carrying them on, and the tendency of modern legislation has certainly been to attain that object, by subjecting such trades to regulation and official supervision. Only some classes of offensive businesses have, however, been so dealt with, whilst other classes of trades, productive probably of quite as much nuisance, have been allowed to remain without interference. The anomalous state of the law on this subject is difficult to understand; and, if it can be shown that the result of the supervision given to those nuisance-trades which have been regulated by statute has been beneficial to the public and not injurious to the trades, it may, I think, be fairly inferred that the extension of such supervision to other offensive trades will also be of public advantage.

I will, therefore, endeavour shortly to describe, in illustration of this proposition, what legislation and supervision have done towards protecting the public from nuisance arising in some classes of offensive trades carried on in the metropolis, and then to briefly indicate some industrial operations causing nuisance which are not under legislative restrictions.

The Metropolitan Building Act, 1844.—Modern legislation on this subject may, so far as London is concerned, be said to have commenced with the Metropolitan Building Act of 1844. Section 55 of that Act provided, with regard to the business of a blood boiler, bone boiler, fellmonger, soap boiler, tallow melter, tripe boiler, slaughterer of cattle, sheep, or horses, and any other like business offensive or noxious, that it should be unlawful (1) hereafter to erect any dwelling within fifty feet of a building used for any of the specified businesses [I do not suppose that this provision has ever been enforced or acted upon]. (2) To establish or newly carry on any such business, either in a building, in a vault, or in the open air at a less distance than forty feet from any public way or fifty feet from a dwelling [I do not think this provision was enforced between 1844 and 1874]; and (3) That if any such business be now carried on within the distances prescribed in the last paragraph, then, from the expiration of the period of thirty years, it shall cease to be lawful to carry on such business in such situation, save as hereinafter provided.

* Read before the Society of Medical Officers of Health, on Friday, Nov. 1, 1884.

As the expiration of the thirty years of grace provided for in the Building Act approached, the implicated trades grew alarmed, and were successful in obtaining the appointment of a committee of the House of Commons in the session of 1873 'to consider the operation of clauses 55 and 56 of Act 7 and 8 Victoria, cap. 84, and the best means of making provision concerning the offensive and noxious businesses therein specified.'

That committee, after taking a great deal of evidence from medical officers of health, from members of the trades, and from other persons (including members of the committee, who had personally inspected both private and public slaughterhouses in the metropolis), recommended that 'all businesses that may be called noxious, whether enumerated in the Act of 1844 or not mentioned in it . . . should not be actually banished from the metropolis unless a case of nuisance can be established against them, but that they should all be subjected to stringent rules and frequent inspection, and the sections of the Act of 1844 concerning the enumerated trades should be repealed.'

The Slaughter-houses, &c. (Metropolis) Act, 1874.—The Government of the day took no action on the report of the Committee, but a Bill was introduced by private members in the Session of 1874, embodying the recommendations of the Select Committee, and this Bill became law as the Slaughter-houses, &c. (Metropolis) Act, 1874. This Act repealed the 55th and 56th sections of the Metropolitan Building Act, 1844, only so far as concerned the business of a soap boiler, tallow melter, knacker, fellmonger, tripe boiler, and slaughterer of cattle. It absolutely prohibited the establishment anew within the metropolis of the business of a blood boiler, bone boiler, manure manufacturer, soap boiler, tallow melter, or knacker, but it permitted the establishment anew of 'the business of a fellmonger, slaughterer of cattle, tripe boiler, and any other business which the local authority may declare by order confirmed by the Local Government Board to be an offensive business,' provided the sanction of the local authority had been formally obtained. The Act also provided for the making of by-laws for regulating the conduct of the specified businesses, and the structure of the premises on which such businesses are carried on.

There were, at the time this Act passed, about 1,429 licensed slaughter-houses in the metropolis, and perhaps rather more than 200 premises upon which the other businesses named in the Act were carried on. The latter number has since increased, not in consequence of new businesses having been established, but because of the additional businesses which the local authority has since declared to be offensive.

All the businesses named in the Act, with one exception, arise out of the slaughtering of animals; in other words, they are trades in which the skin, bones, blood, fat, and offal of animals are utilised; and this is important in connection with the limitation which it imposes on the local authority in declaring other businesses to be offensive businesses within the meaning of the Act. For it is now well established in law, that any businesses dealt with under a statute, must be *ejusdem generis* with the businesses actually named in such statute. The business of a 'manure manufacturer' is, however, also specified in sect. 2 of the Act, and although

y be manure manufacturers who exclude animal matter, that is not usually the

ter-houses.—Beginning with slaughter-houses the local authority made a set of by-laws with the sanitary conditions affecting mess, and these by-laws have proved adequate for their purpose, although they are open to improvement and could be improved. The Board's experience of slaughter-houses only partially confirms the view of the Select Committee that the London slaughter-houses are well kept, as it is found that that was true of only a small proportion of the whole. In a few districts where the sanitary authorities had paid special attention to the condition of these places, and had exercised the powers given them by the 93rd section of the Sanitary Management Amendment Act, of objecting to the licensing justices at the annual special meeting for the renewal of the licenses, the condition of slaughter-houses was found to be good. But in the great bulk of the private slaughter-houses no special supervision appears to have been exercised, and their condition emphatically proved the need for uniform and persistent supervision. At present, of the 620, have been abolished, and of those remaining it can be said that although many are, as to situation and surroundings, few or none are a cause of nuisance, or even of inconvenience.

It is not remembered more than one complaint was made against private slaughter-houses by the local authority during the past year, and the absence of complaint is no sure indication of the absence of nuisance, it is in this case the observation of the officers of the Board. Of groups of offensive businesses dealing in animal substances are in Bermondsey (where tanning, fellmongering, glue and size making, such trades are carried on), and at Belle Vue, at Southwark, and at one or two other places, but isolated businesses of this nature are scattered in nearly all parts of London.

of Offensive Trades.—I need hardly say that the suitability of situation is one of the most important considerations in dealing with offensive trades, or that it would be desirable, if it were possible, that all such trades should be confined to specially suitable localities. It may be said, that the accumulation of a number of small nuisances in one place would have the same effect as that of a large one, making that place unwholesome and quite unsuitable for residential purposes, but that would be the case if the trades were properly regulated, as all that could then arise would be occasional accidental discharges of effluvia. Such an occasional temporary discharge appears almost impracticable to prevent. Such an occasional temporary discharge might be noticed in neighbourhoods where offensive trades were carried on, but might be of serious annoyance in a good residential locality. One of the most troublesome matters in connection with an offensive business carried on in a district is, that every nuisance experienced in the district is put down to it.

A second set of by-laws framed by the local authority under the Act of 1874, deals with the nuisances of a blood boiler, bone boiler, manure fermenter, soap boiler, or tallow melter. This is in addition to the other by-laws made under the Act of 1874, attempting to deal with the conduct of

the businesses in detail; but provision is made in general terms for the storage of offensive material and the conduct of offensive processes in such a way that no effluvia shall escape into the external atmosphere.

As the trades in this group are mostly conducted on a tolerably large scale, and have been in the past productive of much nuisance, I will briefly describe the measures taken for minimising their offensiveness.

Blood Boiling.—The first in the group is the business of a blood boiler, but the process of blood boiling is almost obsolete, having been superseded by better methods. The old process of blood boiling was a most offensive one, consisting as it did in the elimination of moisture from the blood by means of dry heat. At only one establishment was this process found to be carried on in London, and the remedy for the great nuisance that arose was found in the abolition of the process. This was, however, only effected after legal proceedings had been taken and penalties imposed. Blood boiling may still be carried on in a few places outside the metropolis, and, should nuisance be experienced from the process (which would certainly be the case if the works were near inhabited houses), I should recommend that an endeavour should be made to induce the proprietor to adopt a more economical and less offensive method.

Bone Boiling.—The process of bone boiling is a more difficult one to deal with. The business of a bone boiler consists in the collection of both fresh and stale bones from slaughter-houses, butchers' shops, marine store dealers, and other places. These bones are first sorted, and those which are suitable for ultimate use in manufacturing purposes are sawn, usually by steam saws. The remainder are passed through a crushing mill, and are then boiled for the purpose of extracting from them the fatty matter, which is valuable for soap making and other purposes. The boiling is usually effected by free steam, that is, by the injection of steam into the boiling pans; but it is sometimes accomplished by boiling in water by means of a fire underneath each pan. When the process of boiling is completed, the fat is removed from the pans, the water run off, and the bones removed to a storage place called the 'bone hole,' where they accumulate until removed in bulk for use as manure or in manure making.

The nuisances arising in this business are from the accumulation in large quantities of bones that are not always fresh, and from the effluvia that comes from the boiling pans, but probably the greatest amount of effluvia arises from the heating of the decaying bones in the bone hole. This gives rise to fatty ammoniacal odours of an intensely disagreeable nature, which in certain states of the atmosphere will extend to a great distance from the premises; and it is not too much to say that a badly conducted bone-boiling business is an intolerable nuisance to the neighbourhood in which it is carried on. If model premises with the best appliances could be erected in a suitable neighbourhood, this business could, I have no doubt, be carried on quite without public nuisance; but in London such conditions do not exist, and I think the Legislature were well advised in omitting this business from the repealing section of the Act of 1874. The sections of the Building Act of 1844—still in force as far as this business is concerned—were in-

operative in effecting its abolition from the metropolis, although in very few cases were the premises at the prescribed distances from public highways or inhabited houses. The Metropolitan Board of Works were advised that it would be a good defence if a bone boiler could show that he had adopted the best known means for preventing nuisance from his business, and they came to the conclusion that they could obtain the adoption of such means more readily and economically by making and enforcing by-laws than by taking legal proceedings in the superior courts for enforcing the old sections.

That the Board have not been successful in entirely preventing nuisance from this trade is due chiefly to the fact that most of the premises in which it is carried on are old and unsuitable, and also to the fact that the premises are in some of the most thickly populated districts in London. One of the most effectual means for preventing nuisance from this business is, where the construction and arrangement of the buildings admit of it, to make the whole premises a series of close chambers, the outer one alone communicating with the external atmosphere, and then only by one opening on the ground level. This opening serves the double purpose of an air inlet and an entrance gateway. In the outer chamber carts can be loaded or unloaded, bones sorted, sawn or crushed, and, if necessary, the boiling pans (usually on a raised stage) can also be placed. The effluvia arising in this chamber can be disposed of and the place ventilated by the air being constantly drawn through it into an inner close chamber. The effluvia from the boiling-pans should not, however, be allowed to escape into the chamber, but should be drawn off from steam chests at the back of the covered boiling-pans, condensed, and then discharged through pipes into the enclosed ashpit under a furnace fire. In passing through this fire the organic vapours would be burnt.

The inner close chamber should be very solidly constructed, of concrete, if possible, but if of brick-work it should be thickly lined or coated with cement. This mode of construction is necessary, as the chamber is used for the storage of bones, the moist, pungent effluvia from which will otherwise gradually permeate the walls and thus cause external nuisance. This inner chamber should be ventilated by means of an air-shaft of sufficient dimensions leading into a condenser and then into a furnace. It will, I think, be obvious that, where the arrangement and construction of the buildings are good, where the motive power used is sufficient for ensuring that the air is always drawn into and never leaves the building except by means of the exhaust shaft, and where the processes of condensation and combustion are properly carried out, nuisance from this business is hardly possible. There are effectual methods of treating bones and of preventing nuisance other than that just dealt with; but I have described this method rather fully, because it has been applied with success to a variety of other businesses.

Manure Manufacture.—The business of a manure manufacturer was neither named in the Act of 1844, nor in the repealing section of the Act of 1874. It is, however, one of the businesses which are prohibited from being established anew in the metropolis, by the 2nd section of the last-named statute. There is no definition of 'manure manufacturer' in the Act, and the local authority has enforced by-laws in all cases where manure is

manufactured for sale. By manufactured, I mean any trade process, such as mixing, and no attempt to apply the Act has, of course, taken place in cases where stable or other refuse is merely collected and sold as manure. The term 'manure manufacturer' is, however, of wide range as practically applied in the metropolis, and includes on the one hand the collector of refuse fish and fish offal, who at once mixes his materials with such substances as sumach, seal dust, or other absorbent, and sells the mixture as fish manure; and on the other hand includes the large manure works (chiefly on the banks of the Thames), where superphosphates and other artificial or 'chemical' manures are made on a large scale in extensive premises. These latter works are included in the Alkali, &c., Works Regulation Act, 1881; but they were nevertheless under the operation of the Board's by-laws for some years before that Act came into force, and large sums were spent in making extensive alterations, in order to bring the business into compliance with the by-laws.

It will be impossible within the compass of this paper to describe, even briefly, the processes of the various nuisance trades which have been dealt with in London, and that is, perhaps, unnecessary, as they are more or less known to you; but I may say that the effluvia from artificial manure making are distinct in character from any arising in the other regulated trades, being chiefly evolved in the mixture of sulphuric acid with coprolites and other mineral phosphates. The fumes from this process are pungent, irritant, and most offensive, and they extend to a great distance from the works: in some places, and in certain conditions of the atmosphere, for upwards of a mile. It was found that most of the firms carrying on this business in the metropolis had not studied the manufacture from a nuisance-preventing point of view, and as the subject involved much technical detail, it proved convenient to prepare a set of suggestions for the prevention of nuisance in the manufacture, with drawings of appliances.

I believe these suggestions and drawings proved useful beyond the limits of the metropolis, as the Artificial Manure Manufacturers' Association caused them to be printed and supplied to their members in various parts of the kingdom. In the London works great improvement has taken place, and I do not think that any complaint has been made of them for some years past, either by the public or by the Board's inspectors.

Soap Boiling.—Of the business of a soap boiler it is only necessary to say that improved trade processes have so altered the character of soap boiling that it can hardly be now considered an offensive trade. Where, however, tallow or stuff melting is carried on in addition to soap boiling, as is usually the case, very great nuisance may arise. Stuff melting is the liquefaction, usually by free steam, of the refuse fat collected by marine store dealers and others; and, as this material is always in a more or less decomposed condition, the melting of it will prove offensive unless the effluvia are collected, carefully washed in a scrubber, and then passed through a furnace. Very great care is also necessary in the storage of the material, in the disposal of the residue, and in the conduct of the business generally.

Tallow Melting.—The same may be said of tallow-melting, which is a most offensive process when improperly carried on. Tallow-melters' pro-

in many parts of the metropolis, and, in were constant sources of annoyance; but, Act of 1874 came into operation, gradual ment has been made in the methods of with the raw fat, in collecting and destroy- effluvia from the melting, from the press- from the premises generally. Although sums of money have been spent in many of the London tallow-melting estab- lishments, I do not think there is one that I should hold up as a model. Complaints of nuisance, connected with this trade, have, however, now are; but I trust that improvement will still avail the very best methods only are in use.

Remarks also apply to the trades of *knacker* and *boiler*, which were formerly sources of nuisance, but which are now usually conducted. The only remaining business mentioned in the Act of 1874 is that of *fellmonger*, which is confined to the district of Bermondsey, and source of so little nuisance that no by-laws have been made for regulating it, although a general law has been exercised over the works.

Businesses.—The additional businesses, in which animal matter is the chief material used, have been brought under the operation of this Act by the local authority declaring such trades to be offensive, are: blood-drying, glue making, fat-melting and extracting, gut-making and the business of a gut-manufacturer. The other trades usually considered to be trades which are carried on in one district of the metropolis, but with which the Board have held it unnecessary to deal. I refer to the trades of tanner and leather-dresser, which, though not named in the Act, are *ejusdem generis* trades that are named. Complaints have not been made of these trades, and as they are entirely in Bermondsey (which is closely connected with them), it is doubtful if they can be held to be a nuisance to the locality.

Means in securing Improvements.—In endeavouring to improve the methods of preventing the escape of effluvia in carrying on nuisance trades, a difficulty usually met with by a local authority is inability on the part of the trader to see the necessity for improvement. He usually holds fast to the view that his particular business is not offensive, but that it is positively not so, and he infers that the neighbourhood is rather grateful to him for carrying it on in that way. He will be sure to refer to the time, probably over fifty years, that one or two men have been employed at the work, and in the instance the general healthiness of the neighbourhood is evidence of its salubrity. Having met with as best it is able, the local authority has to overcome a matter of far greater difficulty, almost invariable ignorance of the owner of the premises as to the methods of preventing nuisance. Arranged with the supervision of an offensive trade, in my opinion, he is able to do little or nothing in improving the way in which that trade is conducted until he has obtained a tolerable knowledge of its conditions, and especially of the nuisance-preventing methods adopted.

To obtain real and permanent improvement must be able to give good practical advice; and this he must always protect himself by enforcing the fact that the person carrying on the business is responsible to the law, and that,

although he may act upon the advice given, he will not by so doing be relieved of that responsibility.

Changes must be gradual.—In very few cases will it be found possible to obtain great changes at once. The educating effect of improvement, however, soon begins to tell, and it must be a very bad case indeed if a manufacturer takes no pride and credit for the perhaps small improvements he at first makes. When he does begin to feel such a pride it becomes possible to induce him to make greater changes, unless, indeed, he is prevented by want of means. Fortunately economy is on the side of improvement, and after a time the manufacturer begins to see that his alterations have prevented waste, and will probably pay. When that is the case the inspector's work is made comparatively easy. Additional suggestions are readily acted upon, and the manufacturer cordially assists in making his workmen properly use the appliances. Something of this sort has been going on in the metropolis. The persons carrying on offensive trades have been gradually made to improve their processes, and thereby to greatly diminish nuisance; and, where it has been possible, they have done this in a way that has paid them.

Workmen must be interested in Improvements.—But it is not enough to have the manufacturer on the side of improvement: some advantage must always, if possible, be also given to the workmen, as otherwise they will have no inducement but fear to keep them up to the constant use of the appliances.

This lack of sufficient inducement to the workmen is one of the great practical difficulties in the supervision of offensive trades, and it is a difficulty which lasts, as the temptation to shirk what may be a troublesome precaution is always more or less present, while the master or the inspector may be only occasionally on the premises. There is the further difficulty that a manufacturer may be induced to avoid the expense of using the sufficient additional fuel or water necessary in burning or condensing offensive gases. Although there has been often greater comfort to the workmen, and sometimes economy to the master, in adopting improved methods, that is not always the case, and until it is, the most effectual remedy is vigilant and persistent supervision.

Supervision by Inspector.—The qualifications necessary for effectual supervision are high ones, for, in addition to being able to acquire the special knowledge necessary for understanding the working of the regulated trades, an inspector must possess great rectitude, energy, persistence, and tact. If with these qualifications he unites firmness and a kindly manner, he may, and in time does, exert a most salutary influence on both masters and men, who will look with pleasure to his visits, and take a pride in satisfying his requirements.*

The times of inspection must be well arranged; they should be at unusual intervals and at all hours. Indeed, night and Sunday inspections have been frequently found necessary in the metropolis. I need hardly insist on the almost obvious fact, that to do effectual work an inspector must be thoroughly impartial and absolutely free from local or other influence.

I also regard uniformity in administration as of the utmost importance, and the difficulties in attaining this where a number of inspectors are employed

* See on this subject pages 510 and 554 of vol. xiv. of the SANITARY RECORD.

will be readily admitted by those engaged in work of this nature. The method adopted in the metropolis is for the officials to meet weekly to take instructions and to compare notes. This method ensures that the instructions are uniform, and that the experience of each officer benefits the whole.

Investigation of Complaints.—Notwithstanding all the care a local authority may exercise, complaints will now and then be made, and in investigating them no trouble should be spared, because they indicate weakness of supervision. Judicious inquiry should be made of disinterested persons in the neighbourhood of the implicated works, special observation should be kept thereon, and the arrangements for preventing nuisance should be carefully re-examined. The difficulty that a local authority experiences in tracing the source of a nuisance, which is, perhaps, only at times noticeable, is sometimes very great indeed: and several such inquiries, undertaken by the Metropolitan Board of Works during the present year, have terminated unsatisfactorily, the chief reason being the reluctance of householders to give information, and their apparent inability to take precise observations and notes as to the nuisance of which they complain. Although the conduct of those offensive businesses carried on in the metropolis, which are now under statutory regulation and supervision, cannot be said to be entirely satisfactory, it can, I think, fairly be claimed in respect of them that marked improvement has taken place, that such improvement continues, and that, on the whole, the resulting public benefit has amply justified the special legislation on the subject.

Nuisances from Mineral or Vegetable Substances.—I pass now to nuisance trades dealing with mineral or vegetable substances, but to these I can only briefly refer.

It will doubtless be in the recollection of members that a Royal Commission on noxious vapours was appointed, and took evidence during 1876 and 1877. The Metropolitan Board of Works gave evidence before the Commission as to trade nuisances in the metropolis, other than those with which they had power to deal, and urged that such trades should be brought under regulation.

No practical outcome appears to have immediately followed the labours of the Commission, but in 1881 the Alkali, &c., Works Regulation Act was passed. This Act does not deal with the greater part of the trades as to which the Board had given evidence before the Royal Commission, but it includes within its operations sulphuric acid works, gas liquor works, nitric acid works, sulphate and muriate of ammonia works, some of which are carried on in London. I do not know whether any benefit to the metropolis has resulted from the passing of this Act, as its administration is entirely in the hands of inspectors appointed by the Local Government Board.

Brick and Ballast Burners.—There are, however, other trade processes carried on in London which are productive of far greater and more widespread nuisance than any of those trades now under regulation; but of these I will only specially mention the processes of brick burning and ballast burning. Of the horribly offensive nature of the nuisance from these sources, I need scarcely speak, for it is notorious; and hardly a part of London, and especially of the suburbs, has escaped it. The nuisances consist in the pungent and irritating emanations, mostly also

of a putrid character, which are given off in volume during the processes. This putrefaction is frequently the cause of the effluvia being so offensive for sewer gases, especially as such effluvia under atmospheric conditions are carried over a considerable area, extending, in several instances, from my own experience, for nearly a mile from the burning. It is unnecessary for me to detail the causes of the intolerable nuisances arising from these processes, as now carried on in London suburbs, beyond mentioning that the worst are probably caused by the use of improper materials for combustion, and that the whole, if the proper methods were adopted and properly supervised, would cease. There would be no hardship whatever in carrying on such processes as these, when carried on in towns, under regulation and supervision. If this were done, the metropolis, at any rate, would be relieved of an intolerable and unnecessary nuisance.

DISCUSSION.

The President, Dr. Orme Dudfield, in a vote of thanks to Mr. Spencer for his paper, said he would be glad to be informed if it was really practicable to so destroy the organic matters in an offensive state by no unpleasant smell could possibly escape from a chimney-shaft? He cited a case, within Mr. knowledge, which seemed to cast a doubt on the point. He was glad to hear that there was a possibility of improvement in the method of removing fish offal and similar matters. The present system was attended with nuisance, and as far as the trades not regulated, he said that something should be done to diminish annoyance from the usual system of burning bricks, which caused offensive effluvia in the portions of the metropolis during the brick-burning season. He noted that the most offensive of the trade of a bone-boiler arose from the practice of storing the bones after boiling in the hole. This was no part of the process of the business, but the nuisance was analogous to that created by the storage of bones and other animal origin on the premises of marrow-bone dealers—a trade which was just as offensive as any of the regulated businesses which he was of opinion should be dealt with by the Act, so as to insure proper control by the sanitary authorities. He was able to state from personal experience, with the stater 'stuff-melting' was a trade from which a very large nuisance was very likely to arise, and often did arise at the present time. This was due largely to the fact that the 'stuff' went to the melter in an open condition from the collecting shops—in other words, from the marine stores. 'Very great care is necessary in the storage of the material,' as Mr. Rogers properly says. He means on the premises of the melter, but the same care was necessary, under the provisions of the Nuisances Removal Act, to be secured, at the marine stores.

Dr. Rogers said that in the East of London manufactures were carried on of a most offensive character; that he had had some experience of the nuisance from blood-boiling, and that at the present time a considerable nuisance was created in Shadwell by the process of bone-melting, and so offensive is this process that it must

ainly have been included in the list of offensive trades dealt with by the Metropolitan Board of Works.

Dr. C. E. Saunders referred to a very common nuisance, which had not been mentioned by Mr. Spencer. He alluded to the effluvium from fish-ying. He believed this was due to the very inferior quality of the oil which was used, and to certain structural defects in the houses in which the business was carried on. A difficulty in applying a remedy seemed to be due to the fact that it was necessary to have frequent access to the fat-pans, and that any kind of 'hood' which had been designed to keep the vapours confined failed on this account. He would be glad to hear any practical suggestion from Mr. Spencer. He also confirmed what had been said as to the nuisance from fish and poultry offal. This was taken to the outskirts of London, there being no other place to which it could be taken, and it was used to extract such of the material as was good for pigs' food, or for the use of size-makers, &c.; and the rest was used as manure on the fields, causing a great nuisance, and one lasting for a considerable time.

Mr. Shirley Murphy referred to the nuisance caused by brick-burning when bricks were burnt in clamps and the out-puts of dust-bins used, and to the comparative absence of nuisance when this operation was conducted in kilns, with small coal for fuel. The Vestry of St. Pancras had, four years ago, proceeded against a builder who persisted in burning his bricks in the former method after due notice had been given him by the Vestry. Although the evidence before the magistrate as to injury to health was admitted by him to be proved, he eventually decided in favour of the defendant, the defence having been given that it was the custom of the trade to burn bricks in the manner which was the subject of prosecution. Mr. Murphy argued that brick-burning were to be permitted in close proximity to inhabited houses, the method adopted should be strictly regulated.

Dr. Gwynn quoted, as showing the necessity for constant supervision and inspection of certain trades, the case of some tripe-dressers at Hampstead, who were carrying on their trade, surreptitiously, in a shed and stable. Offal was thrust down the drains, and the public sewer became blocked with a mass of putrid and horribly offensive entrails. The result was a serious and dangerous nuisance. With regard to brickfields, the nuisance arising from burning bricks in open clamps with sifted dust-refuse was the cause of very great complaint and annoyance in Hampstead. A distinction must be made between burning bricks in properly constructed kilns, in which coal-dust was used as fuel. Here the nuisance was caused beyond the smoke given off, but when dust-bin refuse was used in open clamps, no amount of sifting out of soft core would prevent the putrid emanations. So great had the nuisance become in the Fleet Road brickfields that the Hampstead Vestry had applied for an interim injunction to restrain owners from carrying on the business, but, owing to the application having been made on the last day but one before the legal vacation, Vice-Chancellor Bacon had declined to hear the case on the plea that the nuisance had been going on for three years. The Hampstead Vestry has now commenced an action at Common Law against the owners of the brickfield, which, it is expected, will be shortly tried.

Dr. Iliff drew attention to the arrangements at risk in the parish of Newington for the disposal of

dust, house-refuse, manure, road-slop, &c. The Vestry of Newington own a piece of ground in the centre of the parish, through which the London, Chatham, and Dover Railway runs; they have a siding on the railway for trucks, a hydraulic lift, and below arches for stables. At first house-refuse and road sweepings were simply mixed together and sent down into the country, but the farmers objected to the broken glass and pots it contained. The hard core is therefore separated, the vegetable refuse is mixed with road scrapings and stable dung, and it is allowed to rest for several weeks and then sent into the country. Fish and meat offal is shot at once into trucks and covered with disinfectants and ashes. The Vestry pay about 1s. 8d. per ton for any distance within a radius of twenty-five miles, with an extra penny per ton per mile to stations beyond that distance. During the year ending Lady Day nearly 2,500 tons were received above the cost of carriage. Depots in the country were found to be necessary to prevent accumulation in town, and a furnace was required for destruction of useless material.

Dr. Kelly spoke of the intolerable nuisance produced in some villages by the conveyance of offal from the metropolis. Much depended on the way in which the material was treated at the time of conveyance and deposit. Fish offal was especially offensive, but stable manure was not.

Dr. Corfield said that most of the improvements in the conduct of noxious businesses at Belle Isle, Islington, were due to Dr. Ballard, who was formerly Medical Officer of Health for that parish. The most offensive trades were the making of artificial manure from coprolites and gut-scraping. He could also corroborate what other speakers had said as to the nuisance caused by brick-burning where the outputs of dust-bins were used. After referring to the health of persons engaged in these trades, he mentioned a suggestion of Professor Bouchardat, that all such businesses should be grouped together, so that the fumes given out by the chemical works would counteract the effects of foul organic vapours from other trades.

Mr. Spencer, in summing up the discussion, stated in answer to Dr. Dudfield, that it was quite practicable to destroy offensive effluvia arising from organic matter by passing such effluvia through a good furnace fire. He found it difficult to ensure such fires being always maintained, excepting where a mechanical stoker was used. Such a stoker was in use at the works referred to by Dr. Dudfield, and any occasional nuisance caused by these works did not arise from unconsumed organic vapours passing out of the chimney shaft. Mr. Spencer, however, recommended that offensive vapours should, where practicable, be passed through a coke or other washer before reaching the furnace.

With regard to the nuisance caused by the collection of offensive material on the premises of marine store dealers, Mr. Spencer said that the Metropolitan Board of Works were of opinion that the remedy could be found under the Nuisances Removal Acts, and that appeared also to be the opinion of the Medical Officers of Health of the Metropolis generally.

With reference to the case of nuisance from the burning of bones for the manufacture of animal charcoal, cited by Dr. Rogers, Mr. Spencer stated that improvements were being made in the processes carried on at the works in question which would, he thought, get rid of the nuisance.

As to the nuisance from fish-frying, mentioned by Dr. Saunders, Mr. Spencer said he concurred in the opinion that the adoption of a hood connected with a chimney shaft did not dispose of the effluvia. He believed a remedy would be found in carrying on the process in an inner room, instead of in the open shop, as is usually the case. The room should have only one opening, protected by a canvas curtain reaching nearly to the floor. The fire and the ash-pit should be inclosed, and a large air-shaft should lead from the upper part of the room into the ash-pit. This plan, he said, had been tried with success in small tallow-melting works. The fire draws the hot offensive vapours out of the room through the shaft and burns them, the fresh air enters the room under the curtain, and no offensive smell escapes into the external atmosphere.

Replying to Dr. Cornfield, Mr. Spencer said that Dr. Ballard had reduced the amount of nuisance from the offensive trades carried on in Belle Isle, Islington, while he was the Medical Officer of Health for that parish, but that great improvement had been made in Belle Isle since Dr. Ballard's time, especially in getting rid of the nuisance caused in the manufacture of catgut.

Mr. Spencer said it was quite practicable to burn bricks without public nuisance. Probably the chief source of offence from the existing system was from the burning of soft core, which consists of vegetable and other offensive matters collected from the London dustbins. This is usually separated at the brickfields from the cinders, &c., and is burnt in the open air without any precautions, causing a horrible nuisance throughout the district. In addition to the successful method of disposing of such refuse adopted by the Vestry of Newington, many towns had got over the difficulty by using Fryer's 'Destructor,' or some other similar appliance in which the material is burned without offence.

SALE OF FOOD AND DRUGS ACT.—Mr. Bernard Dyer, F.C.S., F.I.C., has been appointed public analyst for Southend.

Mr. A. TAYLOR, inspector of the Local Government Board, has recently been making inquiries as to the water-supply in certain colliery villages in the county of Durham, especially those in the rural sanitary district of the Chester-le-Street, Durham, and Lanchester Unions, and has made an interesting and exhaustive report on the subject. Mr. Taylor says the common practice in these colliery districts is for the water to be supplied by the owners to their own workmen alone; the occupants of houses belonging to other landlords must get their supply as best they can. The universal opinion of colliery managers, as far as Mr. Taylor's experience went, is that water is properly and abundantly supplied if a single stout pipe be fixed at one end, or possibly at either end, of a long pit-row, numbering from fifty to one hundred cottages—double or single, as the case may be. The too common practice is to derive the supply from water pumped from the pit's 'sump,' which receives the urine and excreta from the horses and men down the pit. The inhabitants very naturally manifest a dislike to use such water more than they can possibly help, and often have to travel a considerable distance to get a purer, if scanty, supply from natural springs. He adds that the existing system of supply is radically bad, and ought to be everywhere superseded by the rural sanitary authorities taking the matter into their own hands. Several members of the Lanchester Rural Sanitary Authority, who are also colliery managers, have challenged the statements and inferences of the inspector, and a special committee has been appointed to inquire into the matter.

THE WOOD ENCLOSURES OF SANITARY FITTINGS.

By D. J. EBBETTS.

THOUGH so much attention has been paid to sanitary fittings of late years, but little has been said, so far as I know, of their enclosures.

It may be conceded at once that the sanitary fitting is of very much more importance than its wood enclosure, but, if we are to have perfect fittings, surely it is desirable that we should consider whether the woodwork generally employed is capable or not of improvement.

We all remember the early w.c. enclosures, with a lid hinged, but with seat and riser screwed. This arrangement satisfied all the requirements of the time. If any repairs were necessary to the apparatus, the workmen could readily remove the woodwork. Its removal by the *householder* for any other purpose was never dreamt of by the most advanced sanitarian—if such a being existed at the time of which I am speaking. A w.c. apparatus was a thing to conceal as much as possible, and when you had well cased it in and had shut down the lid, it was felt that you had effectually cut off any communication with the offensive drains, and had done all that the most careful regard for decency could expect.

Our ideas on such subjects are greatly altered nowadays, and I think it is not difficult to show how eminently desirable it is that sanitary fittings of all kinds should be capable of being readily uncovered and exposed on all side.

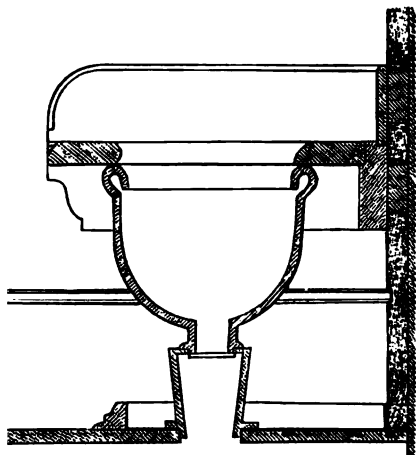
In boxed-in w.c.'s (in nearly all cases) the brickwork and flooring within the wood enclosures, being out of sight, are left by the builder in a rough unfinished and untidy state, such that the most fastidious housekeeper would find it impossible to keep sweet and clean, even if she were not obstructed by the woodwork in her efforts to do so. And as water will occasionally slop over the edge of the pan, and leakages occur, and dust and cobwebs settle and collect upon the apparatus, as well as upon the surrounding brickwork, it results that generally the precincts of the fitting are in a very dirty, sloppy, and grimy state. It needs no argument of mine to show that this ought not to be, and I think all will admit that, in order to insure the proper periodical cleansing of the space referred to, it ought to be readily accessible, if not constantly in sight.

Something of this kind has been felt, no doubt, from time to time, and the enclosure has been made more easily removable. Many plans have been advocated. In one which you may sometimes meet with, the seat is hinged to throw back, and the riser is hinged to open against the wall. This, no doubt, is a good arrangement as far as it goes, but it involves more *fixed woodwork* than necessary, encumbering seriously any examination or cleansing of the apparatus. Besides, it would appear very desirable that it should not only be possible to examine the apparatus readily, but that it should always be in evidence and accessible.

Out of sight, out of mind, is an old proverb, and its truth in this application will be admitted. It appears to me, therefore, that a spot requiring an exceptional amount of attention, should not be shut out from sight even by hinged doors.

I suggest, then, that the woodwork of a valve w.c. should consist of a strong mahogany seat, hinged to throw back, resting upon and hinged to return

plugged to the walls, and with narrow skirts as shown in the illustration. This arrangement involves the additional advantage that the floor would have to be properly finished, and the would have to be plastered, cemented, or



d with tiles, &c., to agree with the room. If method of covering the apparatus is adopted, will be found a further incidental gain, in that set can be at once converted into a slop sink al by throwing back the seat.

e persons will object to the china pan, &c., visible, but those who have not seen a closet n this way will be surprised to find how little paratus shows. In a proper apparatus there ing visible that is really objectionable, and if pearance of the white pan is disliked by some,

be supplied by the makers printed with ic designs to please the most exacting. h, as one of the canons of good taste insists l objects should be, above all things, appro- to their use, there would seem to be little to to in the clean white pan.

ve up the usual mahogany lid and frame y. It answers no useful purpose; it encum- closet and engenders in the minds of many a of safety which it cannot possibly satisfy.

ve confined my remarks to the fittings neces- or a 'valve closet,' because those who wish to 'wash-out' apparatus can purchase a w.c. of ind, which is already supplied by the makers seat hinged at back, and resting upon two orbels, and the pan of which is ornamented he intension that it should be fixed inde- ntly of any other woodwork.

re are at least two w.c.'s in the market of the refer to, namely, Doulton's 'Lambeth Com- on Closet' and Twyford's 'Unitas Closet.' of these closets have front outlets, and those lesire to use 'wash-out' closets cannot do than to inspect these goods before determin- on their purchase; although, personally, I ate very much the use of raised floral orna- upon the pans, as being decidedly out of place, giving a multitude of unnecessary surfaces retention of dust, &c.

ar I have spoken only of w.c.'s, as being the mportant of sanitary fittings, but the same ents will apply, with more or less force, to all and it would be easy to show, on some future

occasion, how the same principles may be applied to them.

The subject of my remarks may appear to be a trivial one, but a careful consideration will, I believe, show that it is only by serious attention to such small details, that anything like real perfection of sanitary work can be attained.

THE REGULATION OF THE SUPPLY OF WATER TO CITIES AND TOWNS.*

By WILLIAM KEY,

Gas Engineer, Tradeston Gas Works, Glasgow.

THE subject of the more economical distribution of the water supply to cities and towns is admitted by all those who have given the problem any study to be one of the very highest importance, and it has afforded many engineers the opportunity of cracking one of the hardest nuts they have ever encountered in attempting to solve the difficulties pertaining to it.

The number of hydraulic engineers of experience who have made this problem a special study, and designed apparatus with the view of attaining by such means the object to be desired, and with results more or less successful, proves the general acknowledgment that some contrivance to be applied to the mains is necessary.

Such an instrument to be adequate must be self-acting, and receive the water from the main at its inlet, under great and ever-varying pressures, and shall pass the water on at a reduced, but more uniform pressure into the mains carrying it onwards.

The difficulty attending the regulation of water under heavy pressure in its passage along the mains, as compared with gas, is due chiefly to their physical differences as fluids, the gas being exceedingly elastic, while water is not.

Before I proceed to explain the design and action of the instrument, as shown by the diagram, which has been found to perform all the functions requisite for the perfect control and regulation of the flow of water, I will make a few remarks leading up to the reasons why such an instrument is necessary to the proper control and distribution of water.

Cities and towns are generally built on sites having within their boundaries districts differing greatly in level, and, when the water is led on, the elevated and low districts draw their supply from a source common to them both. Thus the pressure necessarily increases and accumulates excessively as it reaches the lower levels; and this is found to be the case more especially at night, when the consumption is least. Sometimes the pressure becomes double, or even more than treble, in the lower districts than what is actually required for an adequate supply in the higher districts.

A water supply distributed in this manner seldom gives unqualified satisfaction, for, whereas abundant pressure is found at the lower levels during the heavy withdrawing or consuming hours, the high levels too often have little or no water, or a supply and pressure adequate for their purposes only reaches them when the residents are preparing to go to rest for the night. The steady supply remains with them while they slumber, but with the early ringing of bells, sounding of horns, and blowing of whistles in the morning, the pressure steadily and surely disappears.

* Read at the meeting of the Philosophical Society of Glasgow, December 19, 1884.

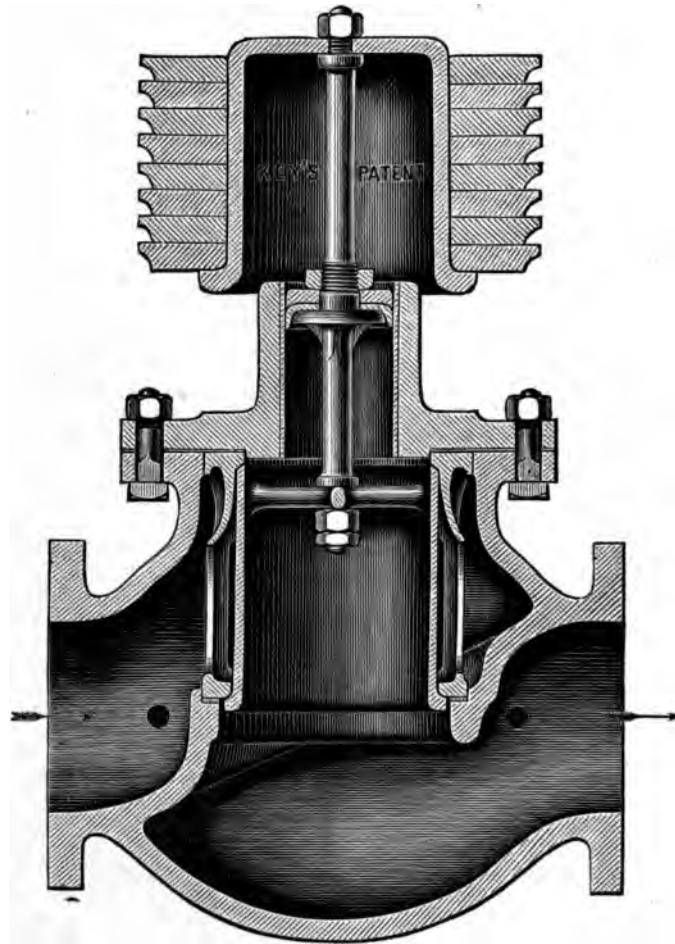
This is not as it ought to be, for in a residential district we all know what it means, when our most approved system of sanitation depends wholly on water carriage and a regular and abundant supply.

Therefore, the first aim when water has been brought within the limits of a city should be, how to distribute the precious fluid, so that all levels would have at all times a supply abundant for the many uses for which it is required.

I believe much more water is now used than formerly, in our city and suburbs, during the spring, summer, and autumn months for the purpose of laying dust, than which a more subtle and perfect carrier of disease would be difficult to find; also, great volumes are used daily through hose pipes to

This statement brings me to a question that very naturally arises. Can a moderate supply of water be given to every customer under pressure, in such a way as to enable all to have share without in any way disturbing existing property fixtures, or seriously desiring to restrict volume of water used, and only as far as possible limiting the volume of water wasted?

It can, and to do so, our efforts toward an equal distribution of water in cities, should only meantime tend to the stoppage of waste. Under this head, we are apt to ask, Does our present method of charging for domestic water supply at so much per pound of rental conduce to negligence or waste?



thoroughly scour back areas, &c., and probably this is at once the cheapest way of maintaining the health of a great city, as it is without doubt the quickest method of cleansing and getting rid of the impurities inseparable from city slums, areas, and closes.

We have now for all these and other purposes a weight of water delivered for each individual, equivalent to a consumption for every man, woman, and child within the area of supply of 500 pounds' weight of water daily; this being equal to a supply to each dwelling of a weight of our pure Loch Katrine water, delivered in the enormous quantity of over twenty-four cwts. daily.

We know it does; we observe it daily. A weight of so much per pound of rental per annum produces no inducement to save; so the habitually thrifty have to pay for their share and a proportionate waste of those who are thoughtlessly careless of a glorious water supply.

There is no other commodity we know of that can be bought and sold in the same way; but then, say, water is a necessity to our health and our existence, and ought to be free to all to use as they please. I might with as good argument and as much reason say gas light has also become a necessity to our existence, and this argument carried with it

weight, and materially assisted in legalising the use of gas works to corporations.

It is both the supply of gas and water are the rights of the citizens, and as it costs to bring a cubic foot of gas, or 1,000 cubic feet of water in the reach of the customers—probably nearly alike—the rule by which the one is paid at a rate of so much per pound of rental, stands equally good for the other. If it were would still exist those who would use from 100 to 800 times more than enough of a commodity, and still desire to pay no more than those who used their privileges with comfort and economy, without waste or abuse.

In the case, there is no disputing the fact that water was sold by meter for domestic use, and gas is now sold—the result would be a great boon for the city. There would be a saving for the boon we enjoy in our Glasgow system. There would be greater thrift and less waste at the time has not yet arrived when the meter will be called upon to pass a 'Sale of Gas Act,' although there is little doubt in the future that the compulsory sale of water for domestic use by meter will become law. Any arrangement for domestic water supply by meter, while preventing waste, would require consumers to pay for the volume they had actually used. Such a system, although appearing equitable and reasonable in the meantime not quite prepared to adopt it as a method of reducing waste. It would lead to endless trouble, it would conduce to the want of proper cleanliness of the house, of the health of the person, together with a stunted and cramped state of stairs and courts. Thus the compelling to pay for being comfortably clean, for the person and surroundings, would be affected by those who stunted their use of water, and endangered by risks of epidemics from the want of the cleanly. Our sanitary authorities would have more trouble, and the extra cost of examining and cleaning many more houses in the city than presently visited, together with the risk of an epidemic which no estimate of the value, would entirely outweigh all the benefit to be effected by a supply of water for all purposes by meter.

I conclude, that the volume of water to be stinted, but it ought to be so governed, that the pressure in a given street any hour of the twenty-four should be no greater than what has been found to be quite sufficient during the hours of greatest consumption. To accomplish this, streets and districts should have the supply governed by the contrivance for the purpose, and which is self-acting. And the leading main pipes carry forward the high pressure to the districts.

The diagram of the apparatus employed is shown in the diagram on page 506. It is entirely self-acting, and consists of a valve chamber provided with an inlet pipe, and having a dividing web or partition with or forming a seat or casing for an annular equilibrium valve, through which the water, the arrangement being actuated by the pressure of water on a piston, connected directly to the valve. The piston is weighted to balance the pressure on it, and to correspond to the pressure at which it is intended the valve should remain open, and allow the water to pass when the pressure of the water is greater

than and overcomes the opposing weight on the piston, the valve rises, and is partially closed, and the supply of water passing through the valve is diminished; and when the water pressure is less than, and is overcome by the opposing weight on the piston, the valve opens, so that a greater supply passes through it. The piston is open directly to the discharge side of the valve, and can be so loaded or regulated as to correspond exactly with the rate of consumption.

Next to the fact of the instrument being a most satisfactory controller of water supply, the important feature of the design is that, should the pressure from any cause on the inlet side of the valve fall below what the outlet had been set for to be maintained, the valve immediately falls full open, allowing all the water coming forward to pass full bore through the valve, and remains so until the outlet pressure rises higher than the valve was set for, when the extra pressure acting on the piston at once raises the valve, and cuts off from the outlet side the excess of pressure above what it was originally set to maintain; or, generally, when the pressure on the outlet is sufficient to overcome the load by acting on the piston, the equilibrium tubular valve is raised and shuts off the water, falling again, and allowing the water to pass whenever the outlet pressure falls below the point the governor was set to maintain.

I do not claim for this valve any of the offices of a stop-cock, or to govern a supply to be counted by drops. An essential feature of the valve is that the main leading from the valve is constantly kept charged with water, and, when shut, leaks sufficiently to maintain the outlet pressure that may be desired. It is extremely simple. The moving equilibrium annular valve gives neither wear nor tear in its action. It is compact, and adaptable to any situation. Once set, it requires no further attention. It is durable. It cannot go out of order. The exceedingly small range of travel of the piston in order to give full area of the connecting pipes gives very little wear and tear of the cup leather, and this is helped by the piston cylinder being lined with brass. An almost equable pressure would be maintained over the whole city. A better supply would be given to residences and factories situated at the high levels. All excess of pressure above what is found to be effective and sufficient during day for the streets and districts governed would be held back and concentrated in the leading mains through every locality. This would be a great advantage for purposes of extinguishing fire: the entire pressure would be concentrated in the high-pressure mains, and available for hose-pipes. The adoption of this system would constitute a 'constant service' in every meaning of the word, the present so-called constant system being more intermittent than constant, as the pressures in the mains vary every hour of the day. And in many cities the large volume of water that would be saved would not make so urgent contemplated new works which are presently absolutely necessary, to keep up existing leakage, and the looking out for additional sources of supply would be indefinitely postponed.

Before concluding I shall quote the opinion of the engineer for the Loch Katrine water supply, Mr. Bateman, in his report. On June 6, 1860, three months after the introduction of Loch Katrine water, Mr. Bateman made the following report. 'I must draw attention to the present consumption of water, which is increasing so rapidly as to be

really alarming, and quite warrants the apprehensions I felt, and the pains I took to guard against it, when writing my report on the city piping, 1858. Referring then to the habits of waste which existed, and to the imperfect state of the fittings, I observed that should the same state of things continue under a constant supply, and at high pressure, the waste would be enormous, and even Loch Katrine would be found inadequate to meet it.

At the same time I wrote this the consumption on the north side of the river was little under 13,000,000 gallons a day. In November last, eighteen months later, it had increased to 14,000,000, and in the beginning of March of this year, after the whole city on this side was supplied with the Loch Katrine water, it was 15,000,000 gallons per day. It has gone on increasing since then, till it now amounts to 18,000,000 gallons per day, being an increase of 3,000,000 gallons per day in three months. The consumption by the city was measured at the Mugdock reservoir every hour for twenty-four hours consecutively in the beginning of this week. The greatest draught is about one o'clock in the day, when it is at the rate of 22,000,000 gallons a day, and the least at two o'clock in the morning, when it amounts to 14,000,000. At this time of the night nearly the whole of this quantity must be wasted. The total consumption of the city from Loch Katrine and Gorbals together is 22,000,000 gallons a day, being at the rate of 50 gallons per head, and just twice, in gross quantity, as much as Manchester and Salford take for a larger population.

Upon this statement Mr. Gale, the resident engineer, was instructed to institute such an examination as would lead to the discovery of the cause of the excessive waste of water. He found that, from badly-constructed and leaky taps *alone* the waste amounted to 7,200,000 gallons per day, equal to 20 gallons per head, the value of which, if sold for trade purposes, would have been about 50,000*l.* per annum.

I may add that since the date of that report, fourteen years ago, the consumption has nearly doubled, having increased from 22,000,000 gallons per day to 40,000,000 gallons per day at the present time. This gives a consumption for all purposes still of 50 gallons per head of population, the population supplied by water being as nearly as possible 796,000. Of this 40,000,000 gallons per day, 36 gallons per head is accounted for as used or misused for domestic supply, and 14 gallons per head per day as used for trade purposes, making up the 50 gallons per head per day. So that, although means have been and are constantly being employed to reduce the waste, there is every reason to conjecture that there is still over the whole area of supply a waste of 20 gallons per head per day, or, say, 15,000,000 gallons wasted daily, being a volume equivalent to the total daily supply of water from Loch Katrine to the north side of the city during the first year of its introduction.

Mr. Gale, the Glasgow Waterworks engineer, is performing a great and valuable necessary work at the present time in subdividing the city into districts for the purpose of approximately ascertaining the leakage during the hours of night, by fixing waste-water meters in these districts.

The information thus obtained forms a guide in the searching for the cause of excessive waste, but is of itself incomplete; the ascertained fact saves none of the water from being run to waste, whereas

by fixing one of these pressure reducers would immediately be saved a considerable volume of water. And as the expense of opening the street and breaking the water-main, and fixing both a waste-water meter and a waste-water preventer, would be little more than the cost of either separately, I would suggest that this be done, and when the leakage had been ascertained the governor being put out of action, then, by removing the load from the piston, and regulating the pressure to what may be desirable, a test would at once be made as to what volume of the loss had been recovered by the use of this instrument.

I have every confidence that the result will be very encouraging, and if the whole city be supplied as I have suggested, the ratepayers would get a very good thing. If only one fourth of the loss by leakage would be recovered, this would be equivalent to a saving of water at trade rates of the value of 12*l.* per annum.

Cities supplied at present under the intermittent system could now be put under a constant system, the only drawback to the old-fashioned system being the constant system having by this invention the pressure removed, as the pressures would now remain a constant.

Burst pipes, loss of water, and destruction of property thereby would be unknown.

A city fitted up completely in districts governed by this apparatus would have a complete escape valves; the pistons yielding to the pressure and exhaust the force of any concussion.

These instruments are admirably adapted to be put in place of break-pressure lodges along line of pipes from reservoirs to place of consumption, and in duplicate for this purpose, will only cost one-tenth of the expense for a service reservoir.

The makers of Key's Patent Pressure Reducers are Messrs. the Glenfield Company, 1, Kilmarnock.

[Since this paper was read we understand that the engineer of the Glasgow Waterworks has placed of Mr. Key's governors on a district of 2,100 inhabitants. The results are recorded by a meter, and readings will be resumed after the holidays, as far as ascertained the saving of water both day and night is considerable, and the inventor's expectations have been more than realised.—*Ed.*]

NATIONAL HEALTH SOCIETY.—Mrs. Priestly kindly consented to deliver a lecture for this society at the Parkes Museum, Margaret Street, on Thursday 22nd inst., at 4 o'clock P.M. The subject of the lecture will be House Sanitation, and the title 'Unseen I in the House.' We are glad to know that the National Health Society is endeavouring to instruct women in this very essential branch of domestic education. It is a most important branch of knowledge for the mistresses of homes and families such knowledge is so important.

LIABILITY OF LODGING-HOUSE KEEPERS.—A question of law has been decided by the East London magistrates. A mechanic, who arrived in the town and set up his abode at a common lodging-house, who died somewhat suddenly. The mother of the deceased, not having the means to meet the cost of the funeral, brought the matter before the magistrates. The borough guardians declined to interfere on the ground that the lodging-house keepers were responsible for the death of a lodger dying under such circumstances. The lodging-house keeper disputed his liability, but the magistrates decided that the funeral should be carried out at his expense.

PENNY DINNERS FOR POOR SCHOOL CHILDREN AND COOKING DEPOTS AT GATESHEAD.

By FRANCES JOHNSON.

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THE better housing of the poor is a problem apparently as far from solution as ever, but the better and cheaper feeding of the poor—a question of equal importance—has been satisfactorily dealt with by the Rector of Gateshead. He finds it possible to dine children well for a penny per head, and can give a man an excellent and nutritious dinner for twopence, the profit in both cases being more than sufficient to meet the cost of labour and fuel.

Seven months' experience in providing penny dinners at St. Mary's National School, Gateshead, has proved that it is not necessary to have a large number of children dining in order to make the scheme self-supporting. During the month of August the average daily attendance was not above fifty, yet the average profit was a shilling a day, being more than was needed to pay for labour and gas.

The cooking-apparatus, specially devised by the rector for the purpose of economising labour and fuel, is a cylinder-shaped upright boiler, taking up very little room. The sides and lid are coated with a non-conducting material, so that nearly all the heat is retained, and it is possible to cook for two hundred children at an expenditure of not more than fourpence or fivepence in gas. Very little labour is required. The cooker being a sort of huge Warren's pot—a boiler within a boiler—the food cannot be burnt, and once placed in the apparatus, it may be left to take care of itself. The continual watching and stirring and attention to the fire that is needed in cooking with the ordinary boiler is saved. Most food is improved by being cooked very slowly; the use of the inner tin insures this. Where rapid boiling is necessary, as in the case of puddings, the inner tin is removed. The cooking is done by two of Fletcher's atmospheric gas-burners.

The Board Schools throughout Gateshead have adopted the scheme, and are working on exactly the same lines as St. Mary's Schools, with perfect success. They use Mr. Moore-Ede's cooking-apparatus, which takes up so little room that in several cases a disused coal-cellar has been converted into an admirable little kitchen, quite large enough for the cooker, the cook, and all culinary operations. The dinner being served in the schools, there is no rent to pay either for dining-room or kitchen. The teachers take it in turn—one from each department—to attend at dinner, to keep order and assist—not a very arduous duty. It is seldom that the same teacher is called upon oftener than once a week. The only voluntary helper is one lady for each school to order the dinner, check the stores, and keep accounts. The scheme is worked entirely by the school staff, thus avoiding that irregularity which so often attends work dependent on outside voluntary helpers. Only children of widows, or those whose parents are out of work or on short time, are allowed to dine at school. These are very inadequately fed at home, and are thankful to secure a good mid-day meal for a penny. The scheme has enabled the Relief Committee at once to grapple

with the distress—so far as the children are concerned—which at present exists in Gateshead. The teachers and School Board officers know the number of destitute children, whose parents are quite unable to feed them at home or provide a penny for the school dinner, and the Relief Committee issue weekly to each school the number of dinner-tickets needed. In this month of December 1,200 free dinners are allowed daily.

The effect of good food soon shows itself in the children both physically and mentally. From being white, listless, and dispirited, and slow at their schoolwork, they become bright, vigorous, alert, both in mind and body, and so full of spirits that their teachers sometimes threaten laughingly to 'dock their dinner allowance.'

Undoubtedly the scheme is also a strong civilising and humanising agency. The neatly-laid tables, the white cloths, the shining pewter spoons and mugs, have already brought about a more decent mode of eating and better manners generally. The lad who used to eat the 'foggiest' bit of his own pudding and then force the rest on to a smaller boy's plate, sending up his own for a fresh supply, understands now that it is unfair, and 'bad manners.' It is no longer considered the thing to throw bones, fat, and other rejected morsels under the table, or deposit them surreptitiously on your neighbour's plate. A boy who is caught in the act is immediately pounced upon by the next lad, and held up to scorn as '*a chap as knows no better nor chuck his bones under the table.*' The children are evidently ambitious to behave well, and pleased to be taught.

The dinners are also a humanising agency. Formerly many of the children, especially the bigger lads, would rush home famishing after the morning school work, ravenous as young wolves. There would be a fight for the largest share of the insufficient meal, and they would be driven out again by the worried mother with their hunch of bread, and a scolding or a blow for being so hungry. The better-tempered ones would try to forget their unsatisfied cravings in play, but others would prowl about in a sullen, half-famished condition, ready to snatch the bread from a younger child, or do anything for food. It was a terribly hardening process.

These lads first came to the dinners looking anxious, watchful, distrustful—ready to fight for their share if necessary. When they at last realised that each would be helped fairly in his turn, and might have as much as he could eat, they became altogether different boys, so softened and humanised. They flock in now, smiling and confident, tuck their little bare feet safely out of harm's way under the forms, and speculate in delighted whispers as to what there will be for dinner, and how many helpings they think they can manage. Relieved from the one passionate absorbing anxiety as to whether he will get enough to eat, the boy is no longer the mere hungry animal full of selfish ways and fears; he develops into the human social being, with a kindly interest in his fellows, alive to anything humorous that is going on, and, better still, alive to the wants of others. The penny-dinner scheme is of enormous value to children who are inadequately fed and cared for at home. They are benefited physically, mentally, socially, and morally, and assuredly their lot is brightened. The comfortable dinner-table, the warm appetising food, the unstinted helpings, accompanied by kind words, and occasionally a little quiet fun—these do certainly make one

bright hour in the day for many otherwise very drear and cheerless little lives.

The Cooking Dépôt, established by the Rector of Gateshead, is an admirable scheme for giving greater purchasing power to the wages of the labouring classes. It is estimated that a working man's food costs him on an average 60 per cent. of his annual income! The following statistics show that the cheapening of food is a question of the first importance to the people.

	Per cent. of annual income.
The wealthy classes spend on food	30
Upper middle classes	30 to 40
Lower	40 to 50
Artisan classes	50 to 70

As a rule the poor get a smaller return for money spent on provisions than any other class. They know nothing of the relative value of the different kinds of food, and generally buy the most innutritious. They know nothing of the principles of cooking, and, assisted by defective apparatus, they waste, and burn, and otherwise render indigestible the midday meal.

In an article which appeared in the *Pall Mall Gazette*, by Mr. L. O. Smith, of Stockholm, headed 'My Social Revolution,' the following passage occurs:—

'The cooking question lies at the foundation of the whole movement. I have studied this question for many years, and I have seen that the condition of the people depends more than anything else upon their food. You have done a great deal here in this country for the lodgings of the poor. I have been to-day over the Noel Estate and the Peabody Buildings, and your building societies also are very good; but, take mankind as a whole, and you will find that of the expenditure of a working man 15 per cent. only goes as house-rent, while 60 per cent. goes in food. Therefore if you provide every working man with a free house for ever, the effect is only equal to saving him 15 per cent. of his wages. But if you can make a radical reformation in his food, you have a much greater margin to play upon. If you could provide him with food twice as nourishing as that which he gets now, so that he only needs to buy half as much of it, or if you give him as much food as he gets at present at half the price, you save him at one stroke 30 per cent. of his wages, or twice as much as the whole of his house-rent. And it can be done. For the proof of that, I have done it, and there is no reason why what I have done should not be done in every town and village in the whole world. Believe me, that is a source whence a great increase is to be made to the wealth of our labouring poor. That is where the waste is—a waste which is not only felt in actual expenditure of money on food, but in insufficient nourishment, causing physical degeneracy and a craving for stimulants, which lies at the root of much of the drunkenness of the present day. I begin my reform of society from the bottom—from the food which man eats.'

This theory commending itself to Mr. Moore-Ede, he determined to act upon it, and began by opening a dépôt intended in the first place to supplement the work of the relief committee by supplying nourishing food at the lowest possible rate to unemployed workmen and those working short time. To save rent, two disused school-rooms under an iron church were cleaned out, the walls coloured, and, as inexpensively as possible, they were fitted up, one as a large kitchen,

containing five of the penny-dinner cookers and a pudding-boiler, stores of every kind, and a small office, which is partitioned off; the other was converted into a dining-room, with four long tables covered with white oilcloth, and the necessary forms. A movable counter is fixed in the doorway between the two rooms. Here the customers are served. They wait upon themselves, carrying their food to the tables, and consuming it at their leisure. For a penny a man receives a basin containing a pint of excellent soup, and seven ounces of whole-meal bread. If he is inclined for and can afford a second course, he receives for a penny twelve ounces of very good raisin pudding, hot, light, and digestible; so that for 2d. a man is furnished with a substantial and nourishing meal. The soups are composed of ox-heads, beef bones, peas, lentils, barley, carrots, onions, and other vegetables, and all are highly approved of by the diners, who are artisans on short time, labourers, and men out of employment. The latter usually dine at 11.30 in order to make sure of their dinner before the twelve o'clock rush. Occasionally it happens that two or three arrive too late—all is sold out. The poor fellows know that their penny will do very little towards providing a warm meal elsewhere, and look anxiously at the long row of cookers. 'Can't you make up a basinful out of the lot, master; isn't there a drop o' soup among 'em?' 'Not a drop,' answers the cook. 'Is there ne'er a bit o' puddin' left neither?' 'Not one bit.' Great and unmistakable is the disappointment. Nowhere else can they dine for a penny, and dine well.

There is a large outdoor sale which goes on from 8 A.M. to 1 P.M., the customers being supplied through a sliding hatch fitted up in one of the kitchen windows. The establishment opened with six customers; in a few weeks from two to three hundred men were dining daily, and about 190 gallons of soup and nine stones of the raisin pudding are sold every morning.

The scheme is more than self-supporting. The staff consists of a man and his wife, who cook and serve, and a young fellow, who collects and washes dishes and makes himself generally useful. The goods required are all supplied by contract. The cooking is done scientifically and economically, and the result is that the rector finds himself with a handsome profit in hand, which he is placing at the disposal of the relief committee in the form of food tickets for presentation at the dépôt.

It is intended to extend the system, and a company has been formed to establish a Working Men's Restaurant on a large scale. First, second, and third class meals will be provided, and food will be sold out in large or small quantities. Factories at a distance will have their supplies sent in specially constructed vessels, so that the food may retain its heat. The cooking-apparatus will be similar to that used in Mr. Smith's workmen's kitchens at Stockholm, which does its work economically and scientifically. The dietary will be arranged so that each meal will contain the proportion of nitrogen, starch, fatty, and mineral elements considered necessary to supply every demand of the body.

To return to the simple cooking-dépôt, which may be established at so little cost in the neighbourhood of factories, or in the poor quarters of large towns, it is the best antidote to the numerous public-houses, and a great boon to the labouring classes. The Gateshead men, who have given the scheme a trial, are unanimous in declaring that they

themselves as thoroughly sustained, and as equal to hard manual labour, after a twopenny dinner at the depôt as when they had a 'meat dinner' at four times the cost.

PENNY DINNERS.

By EDITH SIMCOX.

WHEN Confucius admired the populousness of a certain Chinese province, a disciple asked what should be done with the people when they were thus numerous. The sage replied, 'Enrich them.' 'And what should be done with them when they are rich?' He answered, 'Teach them.' It must be confessed that we have still something to learn from the political wisdom of ancient China, but in a backhanded way we are drifting towards the same conclusion as Confucius. It was found that a large ignorant population grew poor, and in the attempt to teach the very poor, people have discovered that it is ill learning lessons on an empty stomach. In other words, to get rid of ignorance, which is the mother of poverty, we must get rid of poverty, which is the mother of ignorance; *ergo*, it is quite logical for the friends of education to form an alliance with those who advocate, either as a matter of justice or charity, the claim of children of school age to be provided with sufficient food for their bodies as well as their minds.

One incidental advantage of forcing the poorest children into school is that we are forced to measure the poverty as well as the ignorance of the masses. We see, marshalled in orderly rows for their easier inspection, the white-faced, undersized, bleary-eyed, shock-headed children of poverty, ignorance, and vice; the discipline of the school reduces the outward and visible signs of poverty in rags and dirt, but it also brings into evidence the bodily diseases and mental defects which are the product of chronic destitution, and it brings tens of thousands of half-nourished children into direct relations with persons—school managers, members of School Boards, and the like—who find it intolerable to be in relations with starving babies. The relation is established by the law of the land, and to make it tolerable to the feelings of educationalists, it appears necessary to feed the babies. But don't let us imagine that the hunger is a product of the 'education craze,' or that the children's sufferings were less when they were dirtier and more ragged, sat in heaps on doorsteps and kerbstones in the genial atmosphere of the street, instead of at 'dual desks' in warm and airy class-rooms. It is no kindness to the hungry, weakly children to leave them out of school, but the benefits of school attendance may easily be enhanced if it can be associated with cheap or gratuitous lessons in the art of dining.

There is a good deal in a name, and the phrase 'Penny Dinners' has a happy ambiguity about it which will allow nominally the same remedy to be applied to two different needs. Originally, both in town and country, the first suggestion of such dinners was derived from the sight of children not able for any reason to go home to dinner, who, as a rule, bring with them a slice of dry bread, flavoured with a scrap of cheese, a scrape of dripping, or some equally meagre fare. This is not necessarily a sign of poverty. The mother who goes out to work, or the widowed father, may earn good wages, and in

such a case the offer of a good hot dinner, provided at cost price, in or near the school, will be accepted with thanks, in every part of London, as well as at Gateshead, or in scattered country villages. Parents of this class would have nothing to say to meals provided out of charity for the class labelled 'destitute'; they would as soon send their children to a 'ragged school,' and their just susceptibilities should be considered in every way, so that they may accept the benefit offered to their children without any uncomfortable sense of being patronised or 'done good to.' If the dinners are made popular and kept 'respectable,' they will be used casually by the households in which a wholesome family dinner can be cooked—perhaps usually is—but still may have to be omitted, to save trouble, oftener than is dietetically desirable. These are the natural clients of a self-supporting penny-dinner system, and in some cases perhaps as many as 10 per cent. of the children in a moderately poor school may belong to this class. Then there is the thriftless section, from whom the child may coax a casual penny, though there is rarely money enough in hand to buy the materials of a good cheap dinner long enough beforehand for it to be satisfactorily cooked. Through their children many of the pennies of this class may be helped to a more profitable investment than they could get otherwise.

So far, then, the promoters of penny dinners are engaged in improving the dietary scale of children who would have something to eat anyway, but what about the children whose dietary is as insufficient in quantity as it is in wholesome variety? Take the case of a family neither drunken nor destitute—say a labourer earning 18s. a week all the year round, with a wife and six children under thirteen to keep out of it. Some people might think that this is just a case where penny dinners should be a boon, but a little consideration of the poor wife's budget will tell a different story. Most likely the money will go thus—Rent, 5s. 6d. (one room must be a good size if it is to hold eight people); father's dinner away from home, 6d. daily, 3s.; Sunday dinner for the whole family, say as much as 2s. 6d. (a wild extravagance!); coal, oil, soap, school pence, and all household necessities, 2s.; leaving a balance of 5s. for the food of mother and children throughout the week and the father's breakfast and supper. Put 4d. a week aside for clothes, and there remains just 8d. a day—that is to say, every child must either get its breakfast, dinner, and tea for a penny, or go without one of these elementary meals. The labourer is not to blame for the rack-renting which swallows up his surplus, but his children must be systematically underfed unless they are invited to share in the penny dinners without bringing the penny. But then charitable people say, 'Such cases can be investigated, and the fees paid if they prove to be deserving.' They must beware, however, that their 'investigations' do not repel exactly those deserving families that neither ask nor wish for charity, who can and do rub on without it, and therefore would have as much right as any doctor or shopkeeper to resent outside inquiries into their private affairs. Humane outsiders wish, in the interests of the children and the community, that the four or five children of school age of this typical labourer should be better nourished than the father's wages allow. (This is not the place to discuss whether the father's wages may not advantageously be raised.) But while there are thousands of families

who prefer to live in virtual starvation rather than go into the workhouse, it stands to reason that the labouring poor, who are not quite starving and not at all pauperised, would decline without thanks any offer of food for their children, accompanied by inquiries intended to discover whether or not they were fraudulent beggars. It is, I believe, a mistake to suppose that, if it were generally known that the teachers would give free tickets for the penny dinners to penniless children, all the children would pretend to be penniless, or that those who paid would be jealous of those who did not. The flood of pauperising charity generally flows through denominational channels; and there may be circles where 'humbugging the parson' is regarded as a lucrative industry; but the mass of Board School families have little or no contact for good or ill with any religious organisation; they receive no charity except from each other; and the mother, who, when she has bread to spare, lets her children give 'a piece' to their starving school fellows, will certainly not grudge the latter a good dinner if anyone else will give it them. It is hardly necessary to point out that if a labourer, in regular work at 3s. a day, cannot treat his children to penny dinners there must be a painfully large class of the casually employed, the sick, infirm, widows, and the like, who are even less able to pay, without being necessarily at all more inclined to beg. If we want to have these children better fed than their parents can feed them, they must be courteously and kindly made welcome to the dinner table on the understanding that they pay what they can and when they can; and if no fuss is made about the charitable side of the enterprise, its promoters need not fear being overrun by professional cadgers. On the contrary, I believe if it were known among the parents that outsiders might pay for the poorest scholars, odd coppers and sixpences would be volunteered as a subscription by the parents who thought the gain to their own children worth more than the regulation penny, and by workmen using the schools but too well off to use the dinners.

This is not mere opinion based on an abstract admiration for the proletariat. In the winter of 1881, Lady Brabazon gave some hundreds of pounds to be expended by members of the London School Board, in providing dinners for children attending the poorest schools, and the writer had charge of the experiment in Westminster. It began amidst warnings against ingratitude and envy, and the impossibility of giving to some without giving to the whole school, and certainly if a whole school could be expected anywhere to apply for free rations, it would have as good an excuse in Clare Market and Covent Garden as it could anywhere. But the teachers anticipated no difficulty, and in fact none arose. No child that asked to come was turned away; here and there a wealthy parent begged to send the children if they might pay a penny; the children known to be very poor were specially invited, and from one of these cases came an agreeable proof that Lady Brabazon's hospitality was accepted as it was meant, and not traded upon with unbecoming greediness. A little girl belonging to a very poor family did not appear one day, and when the mistress inquired why she had not come to dinner, she explained that they had all had soup at home from 'the kitchen'—a charitable institution in the neighbourhood. In two small schools, with an attendance together of about 1,000, about 250

children put in a claim for the free dinners. It is impossible to guess how many would have applied for the dinners if payment had been the rule, and were deterred by the appearance of a gift; but, when the funds were running out, the charge of a half-penny was made 'by request' in one school, so as to prolong the feast; with that the average attendance fell from 140 to 80, and though some of the 60 might perhaps have paid, if the condition had been imposed from the first, I should doubt whether more than 50 of the original number could under any circumstances have paid a whole penny. If we suppose another 50 who would have liked to have had the dinners on paying for them, we have from this small school (600) 100 possible clients for a self-supporting dinner system, 50 able to pay a half-penny for what costs a penny, and 50 or thereabouts who must be invited free. The problem is thus not at all hopelessly large, and the Penny Dinner Committees need not court the unpopularity of the Charity Organisation Society by setting up any elaborate machinery for 'investigation.' If the teachers and the School Board visitors recommend the children they know to be in want, if regular attendance is insisted on, and all are expected to pay who are not privately invited to come without, the applications will be few, and in nine cases out of ten from persons in such circumstances as to justify the appeal. There is, we fear, more likelihood of hungry children, too tidy and well-behaved to look very poor, being left without an invitation, than of free tickets being obtained by well-off humbugs anxious to save a pennyworth of food.

The dinners above referred to were provided in the school without any suitable appliances, cooked by the caretaker's wife in the family copper, and served by the teachers, the children bringing their own plates, mugs or bowls, and spoons. The dinners were usually given four days a week, and some days, to save trouble, consisted only of corn and bread, which seemed as popular as anything else, except lentil soup, made according to the subjoined recipe, borrowed from a letter to the *Times*. When the dinners ceased, this recipe was given as a dictation lesson to all the elder boys and girls, together with a portion of lentils and vegetables enough for a family dinner, and they were begged to try and reproduce this favourite dish at home. With very few exceptions all professed to have tried and succeeded (only one aggrieved parent came to complain of her child having been set to make such a nasty mess). In catering for the poorest class it should be remembered that their stomachs have adapted themselves to a monotonous and meagre diet of bread and cheese, bread and tea, or the like, and cannot in all cases pass at once even to an ideal dietary; an attempt to give the children two courses every day must add to the cooking trouble without any certain gain to the children, and it would be probably better to repeat three or four favourite dishes often, with an occasional variety, rather than to ring the changes on a long

* Overnight put 2 lbs. of lentils to soak in 2 quarts of water. First thing next morning put the lentils on the fire in a big pot, with 5 gallons of warm water. Add any vegetables at hand, salt and pepper. Boil three hours, pass through a wire sieve; return to the pot with 8 ounces of dripping or clarified meat. Two kitchen spoonsful of flour are then added, after being gradually and thoroughly mixed in a cup with some of the liquor. In half-an-hour it is ready. The original recipe added, 'Half a loaf of bread may be cut up and boiled with the soup.' We, however, added instead the contents of a 2 lb. tin of Australian meat, cut up small, or fresh bones to the same amount. The exact cost of 4,920 dinners was 4,496 pence, or 37s. 4d. each.

erate bill of fare. The object is not to with any home cookery that is on a sufficient wholesome scale, and the most certain way of getting the dinners for the class that needs to cultivate a wholesome simplicity. Of course it is wasteful to attempt to divide the food into small portions. Each child should have a helping in proportion to its age and size, and provision for a second or a third helping to feed hungry ones, while equally of course it should be allowed to waste or spoil the food. In poor schools there is a demand for $\frac{1}{2}$ d. as a boon even more needed than cheap food, in most cases, to do any real good, these gratuitous, as a family must be very literally when there is not even a morsel of bread fast; but here there is in the nature of a test which will keep away all but the best. Early rising is abhorrent to Londoners, and no child that is not hungry and getting food on any other terms would go to school for a breakfast at 8.15 instead of the last moment for getting an attendance

the infant school probably that regular food makes most difference to the children's power. In the upper standards irregular eating has more to do with the comparative weakness of poor scholars than want of food, as the struggle for existence sharpens the wits, and a first-rate teacher will obtain as good a proportion from Clare Market boys as from the average $\frac{1}{2}$ d. or voluntary school. It is not only in geography the upper standards are already referred to could challenge all schoolboys of their own age; but where the really shows, as in the spirited and intellectual of passages of Shakespeare or Scott, as 'The Ancient Mariner,' the boys of this whether hungry or not, used to acquit themselves in a manner not altogether unworthy of the poet and critic to whose benignant inspection were submitted once a year. Good teaching affects educational results directly, will do far more in a school than good feeding, and only affect them indirectly; the change from a bad teacher produces effects far more lasting and immediate than the change from bad to good. But no one will seriously maintain the only object of feeding the children is to get them to learn their lessons the better, and the lessons are alike means for the production of sane mind and body.

Members of School Boards, who hear all the excuses of parents whose children are kept from school, are nearly as familiar as the doctors of the poor with the medical symptoms of 'poverty, hunger, and cold.' They hear as much about 'bad heads' as the physician Brownie, but it must be confessed that really the outside not the inside of the child is in fault. Under-feeding predisposes to what may be called generically 'dirt' and the drain on the constitution caused by diseases makes good food doubly necessary for a sickly child. There is still a vast amount of suffering from strictly preventable causes, and, but the School Board officers are the enemies of the doctors against it, since they insist on medical advice being obtained for the heads in vain for an indefinite time conveniently enough to warrant absence from school. 'A

copper penny soaked in ink' was the prescription tried in vain by one mother for a 'bad head,' and certainly the health of the juvenile population may be expected to gain when pressure is incidentally brought to bear through the Education Acts against the practice of that sort of domestic medicine. As to the vexed question of the prevalence of headaches among elementary school children, it seems curious that the inquirers have not tried to test their conclusions by asking how many children had a headache on that particular day. Of course some would still answer wildly from mischief, stupidity, or imitateness; but 'habitual' is a hopelessly hard word, and it may be doubted whether 5 per cent. of the children in any elementary school could give a reliable answer, based on the correct interpretation of a question containing such a word. The querist should himself first determine what degree of frequency makes a headache habitual; then, if the 40 or 50 per cent. who claim habitual headaches had answered correctly, a definite proportion (according to the meaning assigned to 'habitual') should on the average have had headaches on any one day. It would not be surprising if the discrepancy was considerable; half the teaching in an elementary school is by leading questions, and the children fail to understand at the first attempt probably more than half the questions specially devised by trained teachers to lead out what they are supposed to know; when they do not understand a question they make a shot at the answer which they think is wanted, guided not by the meaning but by some supposed indication in the teacher's tone or words. An unfamiliar querist, though also trained for the purpose, like a school inspector, proves more unintelligible and is greeted with wilder shots; and the same tendency has to be allowed for in all inquiries addressed to children *en masse*. If headaches were as deplorably frequent as has been suggested, the fact would have thrust itself upon the knowledge of all constant visitors in elementary schools by unmistakable tokens. The poorest children are not Stoics; their feeble bodies give in to pain even more readily than the well fed (which is why corporal punishment is more unpopular in Board Schools than at Eton), and both they and their parents consider any sort of ache a valid excuse for non-attendance; yet headaches are (or were two years ago) practically unknown as an excuse for absence from school. Again, if a child with any ache or pain nevertheless comes to school, it never fails to tell by the motion of the hand whereabouts it is being sorry for itself; a handkerchief is held to the bad eye, a hand goes to the side of the face with the bad tooth or the bad ear, and if twenty children in a school had a headache the same day, twenty little paws would be seen caressing as many foreheads or temples. There is no fashion of malingering, and the teachers don't repress these little signs of woe; but the child supporting its aching head is not a familiar object even to the extent to which eye disease, spectacles, toothache and faceache, and half-wittedness are familiar. Every poor school will show signs of these every or any day, but the headaches are at least invisible. It would be rash to blame the school work even for the spectacles, as it is probable as yet that the school has only brought into evidence defects of eyesight that would not be the less real for being neglected. The faculty, however, would do well to keep their eyes on the needlework authorities of the

Education Department, and protest, with all the authority of their calling, against the ruin of the girls' eyes by their being required to count threads and stitches—and that in the murky atmosphere of London. No amount of penny dinners will guard against this real danger.

A little medical supervision of the time tables in most training colleges might also be a boon to the rising generation of teachers, as they seem devised so as to set as far as possible at naught all the precepts of the favourite 'subject,' animal physiology.

PENNY DINNERS.

BY H. FORBES CLARKE.

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THE cry of 'overpressure' in connection with elementary education, of which the public has heard so much lately, has had at least one good effect. It has brought to light the fact, little realised before, that in our elementary schools are to be found thousands of children in a totally unfit condition to receive instruction, to say nothing of education, simply from the want of sufficient and proper food. This is no new evil; its existence has long been known to practical workers amongst the poorer classes, but no regular and systematic attempt has been made, until lately, to remove this great drawback in the education of the young. The only efforts to meet this difficulty were those put forth by the 'Destitute Children's Dinner Society' and some kindred local institutions, to whom all honour is due for their endeavours to meet, as far as they could, the need of the children in respect of food. But a dinner once a week was obviously inadequate to supply the want of daily meals. At the best it afforded only a temporary relief from hunger.

Whilst the children have, doubtless, benefited physically by their compulsory attendance, for several hours a day, in well-warmed and airy school-rooms,* it is a fact, which need not be dwelt upon in this paper, that the use of their brains, in performing their various school duties, necessitates a larger amount of nourishment than they would require if they had no mental exercise. The attempt at present being made in various parts of the country and in numerous districts in London, to supply sufficient and nourishing mid-day meals by means of penny dinners, partakes, therefore, of an educational even more than of a benevolent character, and must, if successfully carried out, prove of lasting benefit to the scholars.

The advantages of such meals from an educational point of view, none who have considered the subject will deny. When speaking recently to one of her Majesty's inspectors about an endeavour to provide penny dinners in the neighbourhood of the very poor school he was examining, he remarked, 'Now you are beginning at the right end,' and in reply to a gentleman who asked if the children would show any improvement if such dinners were supplied, he said he had no doubt about it.

* Since writing these lines I have met with a striking illustration of the statement made above. On visiting one of the largest infant schools under the London Board in the week after Christmas, and inquiring as to the number present, the head mistress stated that there were about a hundred and twenty children above the average absent on account of illness: this she put down to the recent holidays during which they had played, more than usual, out of doors and in the draughty balconies of the so-called model dwellings near by, and, being insufficiently clothed, they had caught cold and were unable to come back to school.

In a speech delivered in the House of Commons on July 26, 1883, the Right Hon. A. J. Mundella, M.P. drew attention to the recent report of Mr. Marchant Williams, one of the School Board inspectors for London, giving some startling statistics of the number of children attending school without breakfast or without dinner, and also to the marvelously good work done at the Rousdon school. This statement has brought Mr. Mundella inquiries from all parts of the country, and in many places the experience of penny dinners has been tried with most satisfactory results. In this, as in many other respects, the country has set an example to the metropolis, which it has been somewhat slow in following, but at length public interest in the question is largely aroused, and dinner centres are springing up all around.

It is somewhat singular that the first person to take any active measures for providing penny dinners on a self-supporting basis in London was a gentleman unconnected with any school, either Board or voluntary. About a year ago, Mr. S. Fuller, of Bayswater, being much impressed by Mr. Marchant Williams's report, asked him to point out a good district in which to try penny dinners. Mr. Williams referred him to Gifford Street Board School, York Road, Islington, the third largest school under the Board, situated in a poor neighbourhood. Here he found the teachers of the school very willing to co-operate with him, and one of them suggested that he should apply to the Committee of the Mission carried on at Gifford Hall, nearly opposite the Board School. The result was that a large hall and kitchen, with coppers and other conveniences, were freely placed at his disposal. The only incidental expenses were the cook's wages, 2s., and the fuel, about 4s. daily, or a total weekly cost of about 9s. 4d. Here, then, cheap dinners for children on a self-supporting basis were first commenced in London on March 20 last. Ten thousand cheap handbills were circulated in the neighbouring schools, stating that dinners would be supplied at Gifford Hall on four days a week, viz., Tuesday, Wednesday, Thursday, and Friday. In the first week three halfpence were charged for each dinner, but it was found that this was a prohibitive price; it was, therefore, reduced forthwith to a penny. This effort to supply the scholars with satisfying and nourishing food proved most satisfactory. Many mothers who were out at work all day were glad to send their children to get a comfortable dinner for a penny each. In many cases jugs or tin cans were brought, and the dinners were taken away for consumption with other members of the family at home. The teachers of the Gifford Street Board School were supplied with a limited number of tickets which they gave to the most destitute children, who frequently came to school in an underfed condition and whose parents were known to be totally unable to provide the necessary pennies.

Mr. Fuller writes to me of his operations thus:—'The dinners were continued, as far as I am concerned, with the exception of the holidays (and one week when illness prevented my carrying them on from March 20 until Oct. 24. In 93 days I sold 10,016 dinners, or an average of 107 dinners a day. My loss, after paying for provisions, wages, coal, and wood, amounted to 2l. 18s. 1½d. With my present experience I consider I might have turned that loss into a profit. Moreover, a summer test of such an experiment was a severe one; but, in addition to the fact that the children need good food in summer

as in winter, I continued the experiment the summer, in order that I might gain experience before that winter set in, and be able to comparative leisure some of the problems—of penniless children—that would be sure to the front as soon as out-of-work days would brought the usual sufferings.’

He readily admitted that carrying on the through the summer months, when the daily toll to between seventy and eighty, and the expenses remained the same as when the number attended, was, indeed, a severe trial. Fuller paid for his experience, as most to start these dinners will have to do, for of one penny a meal leaves no margin through occasional superabundance of food her cause.

It is only right to state that the teachers of the Street Board School heartily assisted Mr. Fuller in his work by attending in turn to help serve and to keep order. Some of the teachers of the Mission School also rendered valuable help, in particular being present every day, and in charge for many weeks during Mr. Fuller’s in the summer. In the last week of the Committee of the Mission took over the management of the dinners, and, with the of winter, the attendance greatly improved. The average daily number of dinners supplied each been 97, 130, 132, 157, 217, 221, 217, and 211. The scale of payment was arranged with the which she receives daily 1s. 6d. up to 100 2s. from 101 to 150, 2s. 6d. from 151 to 200, from 201 to 250.

The experiment at Gifford Hall naturally attracted considerable attention, and numerous visitors came to the dinners and the class of children who themselves of them.

The next effort in providing self-supporting penny was made by Mr. W. Bousfield, one of the Board members, who, with some friends, a dinner-centre on May 19 in a room below St. John’s Mission, situated on the site of Cremorne Gardens, now known as the End, Chelsea. In the first four weeks the and expenditure there were as follows.

Receipts.		
dining		£ s. d.
23	1,620 dinners	6 15 2
30	729 ”	3 0 9
13	673 ”	2 16 1
20	595 ”	2 9 7
	3,617	£15 1 7

Expenditure.		
		£ s. d.
rent, and wages		6 15 6½
”		2 17 11½
”		2 13 2½
”		2 9 9½
ice, being profit		0 0 1½
		£15 1 7

Expenditure was made up thus.

	£ s. d.
and fuel	1 10 0
”	2 1 6
”	11 9 11½
	£15 1 5½

It was observed there was a decreasing weekly attendance from the first; this continued as the advanced, so that in nine weeks on 5,545 there was a loss of 2l. 13s. 6d. The dinners were discontinued during the holidays

and recommenced in September, but as the Mission room was a considerable distance from the surrounding schools, sufficient children did not come to make the dinners self-supporting. Mr. Bousfield, therefore, discontinued his operations there, but is arranging for dinners to be supplied in part of the covered playground of Cook’s Ground School, which the School Board have placed at his disposal. Here he hopes to secure a better attendance.

In June last the Committee of Representative Managers of London Board Schools appointed a sub-committee to consider the question of cheap dinners in connection with children attending Board Schools. The sub-committee consisted of Lady Stevenson, Mrs. Maitland, Miss King, Rev. J. H. Rose, Messrs. Doll, Housden, and Wade, with Rev. R. J. Simpson as chairman, and Mr. H. Forbes Clarke as honorary secretary. After obtaining all the information they could get from those who had practical experience in the work, they issued a circular to the representative managers of each school or group of schools connected with the committee. In the circular they said—‘In several of our Board Schools many children are unable to learn as much as they otherwise would from the fact that they are insufficiently fed. How to supply this want without pauperising the parents is a difficult problem; but from careful inquiry made by the sub-committee, they have ascertained that under certain conditions substantial and nutritious dinners can be provided at one penny each to pay all expenses.’

The conditions necessary to make such dinners self-supporting are :—

1. An average daily attendance of about 200 children, including those whose portions are purchased for home consumption.
2. Skilful organisation in buying and preparing the necessary food.
3. A suitable room, with one or two coppers available, in the neighbourhood of one or more Board Schools, which can be hired at a moderate rent.
4. A sum of about 10l. for preliminary expenses.

A series of questions asking for information was added, which the managers were requested to answer. It has been found in actual working that where no rent has been paid, and with good management, 100 or 120 dinners daily are sufficient to cover the expenses of food, fuel, and cooking.

The labours of the sub-committee culminated in a most interesting conference of managers and teachers, held on December 6, in the large hall of the Society of Arts, Adelphi, which was crowded. Mr. Sydney Buxton, M.P., presided, and amongst the speakers were the Right Hon. A. J. Mundella, M.P., the Rev. W. Moore Ede, of Gateshead, and several members of the School Board. (See SANITARY RECORD, Dec. 15, 1884, page 271.) A Central Council was appointed for promoting self-supporting penny dinners in connection with elementary schools. The Council is composed of the following ladies and gentlemen :—

President—Right Hon. A. J. Mundella, M.P.
Vice-President—Sydney Buxton, Esq., M.P.
Council—S. D. Fuller, Esq. (chairman); W. Bousfield, Esq., M.L.S.B.; Lady George Hamilton; Miss King; Mrs. Maitland; Miss Mundella; Rev. G. M. Murphy, M.L.S.B.; Sir Henry W. Peek, Bart.; Rev. J. H. Rose; H. Spicer, Esq., M.L.S.B.; Lady Stevenson; Major Wade.
Treasurer—H. E. Hoare, Esq., M.L.S.B.
Hon. Secretary—H. Forbes Clarke, Esq.

The Council have ample evidence that penny dinners can be made self-supporting, after the preliminary expenses, if a sufficient number of children attend daily, and they have already received most gratifying reports as to the great benefit derived by children who have secured these dinners. The Council are prepared, where necessary, to make grants of a limited amount to managers and others who may wish to start dinners on a self-supporting basis. In all applications for grants the amounts of the preliminary expenses for plant, &c., should be stated.

Four months ago there were only two places in London where penny dinners were provided on a self-supporting basis. At the present time there are about fifty penny dinner-centres, either in operation or in preparation. Disappointment has been caused in some districts, owing to the falling off in the attendance, but patience is required to give the experiment a fair trial; faults of management may have to be corrected, and sometimes the quantities supplied need be increased in order to make the dinners more attractive.

As inquiries are often made for details of suitable dinners by persons desirous of providing them, the following dinner recipes are given. They have been tried successfully at Albany Place School Room, Hornsey Road, by a lady who has had great experience in cooking, and has kindly placed them at my disposal:—

DINNERS FOR 100 CHILDREN.

1. Currant pudding, and bread and jam—cost, 8s. 9½d. 4½ lbs. currants, 4½ lbs. suet, 25 lbs. flour.
2. Suet pudding, with jam, and bread and cheese—cost 8s. 10d. 4½ lbs. suet, 3½ lbs. jam, 25 lbs. flour.
3. Rice and milk, and bread and jam—cost, 8s. 0½d. 11 lbs. rice, 3½ lbs. sugar, 2 lbs. grated suet, 11 quarts milk.
4. Mutton broth, and bread—cost, 6s. 6d. 2 sheeps' heads, 6 lbs. barley, 6 lbs. potatoes, 4 lbs. onions, 6d. carrots and turnips, 10 gallons water, pepper and salt; ¾ pint each, and bread.
5. Potato soup, and bread—cost, 8s. 2d. 50 lbs. potatoes, 6 lbs. barley, 1s. bones, 1s. vegetables, 9 gallons water, pepper and salt; ¾ pint each, and bread.
6. Beans and bacon (hot), and bread—cost, 8s. 3½d. 9½ lbs. bacon, 15 lbs. beans, salt.
7. Irish stew, and bread—cost, 6s. 11½d. 8 lbs. mutton (neck), 6 lbs. potatoes, 4 lbs. onions, 1s. vegetables, 9 gallons water, pepper and salt; ¾ pint each, including 1½ oz. meat, and bread.
8. Pea soup, and bread—cost 7s. 8d. 15 lbs. peas, 6 lbs. potatoes, 1s. onions, 1s. bones, 9 gallons water, pepper and salt; ¾ pint each, and bread.
9. Suet pudding with meat, and bread and jam—cost 9s. 1½d. 3½ lbs. suet, 5 lbs. meat, 20 lbs. flour; slice of bread and jam.

There is, no doubt, considerable trouble involved in providing these dinners, and much good management is required to make them cover expenses, but it can be done, and the benefits to the children are so great that they more than compensate for all the labour incurred. All those who are engaged as managers, or otherwise, in elementary school work, should take an interest in the physical condition of the scholars.

That there is abundant need for such dinners is shown by the following table, which has just been

carefully compiled at Gifford Street Board School; in all cases the numbers have been understated rather than overstated.

	(1.) No. who often attend school without food.	(2.) No whose fathers have little or no work.	(3.) No. who have lost their fathers.
Boys.....	152	201	60
Girls.....	125	180	57
Infants...	72	212	33
	349	593	150

Taking the number of children on the registers as 2,000, the percentages appear thus—(1) 17 per cent.; (2) 30 per cent.; (3) 7½ per cent.

If any one doubts the need of penny dinners in many districts, or the advantages derived therefrom, let him visit some school in a poor neighbourhood, and note the pale pinched faces of the children, who are compelled by law to be at school, and often go there totally unfit for their duties, from want of nourishment. Then let him inquire of teachers, whose scholars have had the opportunity of getting penny dinners, say for four weeks, and he will be surprised at the testimony they will give of the improved condition of the children physically and mentally. It was hard work for the children of Israel of old, under the eye of the taskmaster, to make bricks without straw, but it is still harder work for the children of England to-day, under the eye of the schoolmaster, to learn lessons without food. This is an educational difficulty which cries loudly for removal, and the cry must be attended to, or the children will grow up feeble in body and mind. It is to be hoped that the experience gained this winter will show that penny dinners provide an easy remedy for one of the chief evils at present existing in connection with elementary education.

WORK AND FEEDING.—The following significant statement in relation to the difference between ill-fed and well-fed workmen is extracted from Mr. I. Lowthian Bell's recently published volume on the manufacture of iron and steel. It is contained in a letter from a German ironmaster to Mr. Bell:—'I am much amused that you are unable to understand why we require so large a number of men at our blast furnaces, but when I visited England I was also greatly surprised at the few men you employ. . . . We have often the same technical appliances as you in England, for anything an engineer sees he can imitate and construct. But what we cannot imitate is to work with our cheaply-fed men with the same vigour that your English workmen labour who enjoy their good meat.'

TRICYCLE LAW.—At Watford some few weeks ago two tricycle riders were fined for riding on their machines at night without lighted lamps. The decision of the magistrates was challenged, it being maintained that the law related only to bicycles. A few days ago a test case was brought before the magistrates, Mr. Benjamin Nickles having purposely driven a tricycle through the streets without a lighted lamp. After the point at issue had been argued the magistrates dismissed the case. Acting upon this decision, a solicitor applied to the bench to refund the fee imposed in the first case, and this application was eventually complied with.

THE South Stockton Local Board have accepted the tender of Mr. Hunt, amounting to 3,000l., for the construction of a number of new streets in that town. It is intended, as far as possible, to employ the distressed poor on the work.

DINNERS AT ROUSDON.

the Rev. J. CURGENVEN,
Rector of Rousdon.

he little south coast watering places of and Seaton, which are six miles apart, connected by branch line with the South-Ilway, and the former six miles by road to Rousdon Station, the country consists of a strip of coast line almost unbroken by valley except close to the sea. In the very centre of the plateau is the small parish and estate (pronounced *Rousdon*, with the accent on the first syllable).

Mr. Peek, Bart., purchased it some dozen years with the object of building a residence overlooking the English Channel from Portland Bill, and first rebuilding the disused Church, and the rectory with the perpetual annuity of the Wimbleton and Wandsworth Commutation Act.

At the time of the estate was about coincident with the visits of Her Majesty's Inspectors of Schools, which led to the compulsory building of schools. There was no public elementary school within three miles of Rousdon. Before, however, from the Education Department for the formation of a School Board for this neglected district arrived, Sir Henry Peek stepped into the matter with a well-developed plan, the carrying out of which, local and direct, as well as indirect and national, good results we will now briefly

was simply to mark out a school district with a centre, and build a school house every convenient for a public elementary school for about one hundred scholars, and as to carry out the system of all the day a cooked dinner every day.

As the premises were ready the next step was, not merely a well-qualified headmaster, but one well adapted by matrimonial circumstances to carry out the plan (as it then was), and to reside happily in the country, three miles from anything but solitary life. This choice Sir Henry Peek was, as it proved, very successful. He determined to make the education free, but to charge each child the payment of 5*d.* per week for dinners, with a slightly reduced scale for children, the fathers being principally agricultural labourers with the average wages in that shire.

In the autumn of 1876 the school was opened with ninety children (which has remained the number ever since). Most of these had no previous schooling at all before, and their entire want of education was such that scarcely have been conceived possible that in seven years this school would be mentioned in the House of Commons by the head of the Department as one than which (as to its efficiency, &c.) there 'could scarcely

This efficiency has been thoroughly established and increased; and, without robbing it of their due meed, there is no doubt mainly owing to the establishment and continuance of the dinner system.

The rule of payment in advance on Monday mornings and no rebate insures regular attendance during the remainder of the week, as poor parents cannot afford to pay for dinners and not avail themselves of them. It is fair to add that all in the district have regular employment.

The experiment of a very few months was sufficient to convince the parents how thoroughly well spent their pence was in feeding their children, leaving the desire or not for education for them out of the question. There is, therefore, a perfect unanimity throughout the school district, without the aid or existence even of any attendance officer, in aiming at regular attendance.

On the part of the children there is a cheerful alacrity from infant years to set off on their long tramp in almost all weathers in a most exposed country, because they can thoroughly appreciate the comfort and good warm food they get at school, with its consequent cheerful spirits and happiness.

The effect on the health of the children, now so robust and strong, may be well exemplified by the most recent illustration—viz., that in the third week of December, though whooping-cough had been and still was prevalent among them, and the weather was damp and raw, the entry on the master's weekly report was, absentees, 0—that is, every child on the register had appeared on the Monday morning and paid for its week's dinners. Probably such a circumstance in a rural school district (with radius of a mile and a half at least) in the height of winter is unprecedented; but it proves conclusively the good sanitary effect on the children of the daily well-cooked dinners, and their power of shaking off such a trying complaint as whooping-cough.

It is, we believe, a fact that in most of the agricultural labourers' families, at any rate in Devonshire, such a thing as warm cooked food, beyond a plate of boiled potatoes when plenty, is rarely given to their children. Bread, with or without treacle, hard skim-milk cheese, a slice of a dough pasty, &c. Compare the effect of such a diet as this on young children, having often really delicate digestive organs, with that of a regular succession of well-cooked meals all the year round, and it does not need one to be very skilled in medical science to account for the bright healthy appearance of those children who get the latter. From the teacher's point of view there are *willing* pupils whose bumptiousness even is penetrated, owing to good health and regular attendance, and as to corporal punishment or the need of it they are both entirely unknown.

The nature of the food supplied at Rousdon Schools will be found in the table at the end of this paper, and from these materials it will be easily understood how some fifteen or twenty varieties of dinners are given.

A few words about the details of management as to the preparation for cooking, serving, and partaking of meals. The schoolmaster's wife undertakes the whole business, and the elder girls are divided into parties of three or four, and take it in turns every morning to work under her in the kitchen in the preparation (more or less) for each day's dinner, thereby earning the grant for the teaching of cookery.

The only dinner recipe which seems to have puzzled any inquirers is that of the roly-poly bacon

pudding, which is simply made in the same way as the ordinary roly-poly jam pudding, thin slices of lean bacon being spread on the paste in lieu of the jam.

The potatoes are boiled and served separately, and the other vegetables as well, except in the case of soup.

By this means a choice is offered in the rare cases of children being inclined to be fastidious. It is remarkable that the majority of the children dislike the use of milk in rice or other puddings, but plain boiled rice, with the varied accompaniment of sugar, jam, or treacle is quite popular, as well as being the cheapest of the dinners.

The dining-room, as well as by the entrance from the schools, is approached by a short flight of stairs from the kitchen in the master's residence, the capital stove in which supplies also hot pipes to the girls' lavatory above, thereby quickly drying the little damp cloaks, &c., in case of a wet morning's walk. In the dining-room are three parallel lines of tables, on which are spread cloths and plates, with forks, knives, and spoons, as the coming dinner requires. The six eldest girls act as waitresses, a proper quantum of dinner being reserved for them afterwards.

The children are mustered and marshalled in due school order into their places at the tables punctually within a few minutes of noon. After the singing of grace the door from the kitchen opens, and the master appears, followed by his assistants (his own daughters, as it happens), carrying large, flat, iron enamelled pans containing the dinner. Each takes a position conveniently at the end of one of the tables. In the case of puddings the slicing is done in the kitchen. The little waitresses rapidly surround each server with a plate in each hand, darting to the other end for the other portion of the meal if required. The food is dexterously placed on each plate, without exception by *one* movement of the arm only; the most marvellous performance, *e.g.*—which practice makes perfect—being the placing of a quantum of treacle rapidly on each plate, without mess or sticky trail, by one twist round a broad common kitchen knife, and a dab on inside rim of the plate. No difference as to quantity is made on account of the various ages of

the children, except by the number of helps; and as to this there is no limit but the exhaustion of the day's supply. Hence all ages and appetites, balancing one against the other, have just as much as they require. It is a veritable case of Exodus xvi., 18.

Fifteen, or at the utmost twenty minutes, finishes the whole business, and leaves the six little waitresses dining at their leisure before the clearing up.

That, counting the extra grant earned, such dinners can be made (when the necessary room and plant is found) self-supporting, there is no doubt, as the cost of material used is well beneath the children's pence.

The only objection worthy of the name the writer has ever heard is that this system is only another instance of taking off parental responsibility from the labouring classes, which is so increasingly characteristic of the times. To which the obvious reply is that a labouring man—*e.g.* with 12s. a week and five or six children of school age—could certainly not regularly afford more than one penny a day for each of their dinners. It can hardly, therefore, be taking off his responsibility to give his children so far better a pennyworth of food than his wife could obtain for them at home.

The argument of Mr. Mundella, that it is not *over-pressure* but *under-feeding* that makes the requirements of the Education Code difficult of attainment, is undoubtedly proved by this school, as with such originally unpromising material it has been enabled to come up to the highest standard of excellence in elementary schools.

The subject of school dinners having now become one of almost national importance, the above sketch of the history of the first one established on a regular footing cannot be without interest. It has long ago more than rewarded its generous founder by the consciousness he must have of the good his thoroughly successful experiment has already done, and is destined, we trust, more largely to do. Moreover, as a secondary result, he has a population growing up around his family seat drawn towards him and his by ties of gratitude for bodily and mental improvement, and its consequent better worldly prospects.

Particulars of the hot Dinners for 100 Children (three-fifths Standard and two-fifths Infants), as given at the Reindeer (Devon) National Schools during the Summer Months. In Winter the proportion of meat is larger.

	Apples, 1d. per lb.	Bacon, 7d. per lb.	Beans, 1d. per lb.	Bread, 1½d. per lb.	Currants, 4d. per lb.	Flour, 1½d. per lb.	Jam, 4d. per lb.	Lard, 7d. per lb.	Meat, 6d. per lb.	Onions, 1d. per lb.	Potatoes, 1d. per lb.	Peas, 1d. per lb.	Raisins, 4d. per lb.	Rhubarb, 1d. per lb.	Rice, 2d. per lb.	Suet, 6d. per lb.	Sugar, 3d. per lb.	Treacle, 3d. per lb.	Turnips, 1½d. per lb.	Cost of material for 100 children.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	d.
Apple Puddings	28	—	—	—	—	28	—	—	—	—	—	—	—	—	—	3	8	—	—	117
Boiled Rice and Jam	—	—	—	—	—	—	10	—	—	—	—	—	—	—	20	—	—	—	—	46
Boiled Rice and Sugar	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20	—	—	—	—	69
Bread Puddings	—	—	—	3½	8	—	—	3	—	—	—	—	—	—	—	—	20	—	—	105
Currant Puddings	—	—	—	—	9	28	—	—	—	—	—	—	—	—	—	3	—	—	—	96
Jam Puddings	—	—	—	—	—	—	9	—	—	—	—	—	—	—	—	—	—	—	—	90
Raisin Puddings	—	—	—	—	—	28	—	—	—	—	—	—	8	—	—	—	—	—	—	103
Rhubarb Puddings	—	—	—	—	—	28	—	—	—	—	—	—	—	28	—	—	9	—	—	103
Roly-poly Meat Puddings	—	9	7	—	—	16	—	—	—	—	23	—	—	—	—	—	—	—	9	84
Suet Puddings and Treacle Soup	—	—	—	12	—	—	—	—	8	1	23	10	—	—	1	3	—	—	7	108
Total lbs.	28	9	7	44	17	184	19	3	8	1	46	10	8	28	41	18	34	8	16	59 lbs.

The 1,100 dinners as shown above cost for material 1,004 pence. The meat used is fresh and tinned, alternately; and it is always given in soup. For fresh meat, ox-head, leg of beef, &c., is provided; for tinned meat, Australian or American, as the market offers best value and variety. The uncooked material averages (it will be seen) over 7½ oz. for each child's dinner, which is amply sufficient for such a school.

PENNY DINNERS IN ANCOATS, MANCHESTER.

ALEXANDER FORREST, Holt Town, Manchester.

SOMETIME near the end of October a neighbour came to me and said, 'There are a great number of very poor children at our doors, and I wish you would set about some plan to get them a bit of food.' I said, 'I will think it over and let you know in a day or two.' Now to those who know Ancoats I need not say that we have 'the poor always with us.' There may be some before whom this paper will come who do not know Ancoats; to them I say no quarter associated with poverty in any city in England exceeds Ancoats in all the elements of a poor neighbourhood. Firstly, the nationality of the people is very largely Irish; secondly, not one trace of its former respectability in the shape of middle-class houses remains. True, the doctor and the sister live here, but it may be fairly assumed that more from necessity than choice that they have moved off with the others. Railway extension, closing of cellar dwellings, the conversion of large property into business premises, have all contributed to the congestion of population that exists in Ancoats.

Twenty years' experience among the poor has convinced me that there are many forms of charity positively injurious; few will deny that it is a gross abuse of charity to minister to a depraved yearning for drink, while on the other hand it becomes as much a duty as a privilege to feed the hungry and the naked.

I am sure few will credit the amount of misery inflicted on our poor children who are compelled to bear the rigours of the 'Code' in addition to the effects of hunger, and the scant covering that does duty for clothes. I have gone from door to door for the past two months in the courts and alleys of Ancoats. I have heard life histories of misery and destitution long-borne and severe, the bare recital of which would harrow the feelings and lead those who are not conversant with the conditions under which thousands in the great city of Manchester live, to think that the descriptions were highly coloured, and to hope that the reality was surely not so bad. I appeal to all who have had experience in this work, their souls have not sunk within them, to see the utter helplessness and hopelessness of many with whom they have come in contact.

In the course of my visitation to the public schools, there was placed before me most authentic and convincing evidence that from 20 to 40 per cent. of the children were under-fed; that in one classroom of boys, whose ages varied from 7 to 12 years, on Nov. 2, 1884, seventeen out of seventy declared they had not tasted food up till midday; that is, they had come from home without breakfast and with a hard forenoon's task before them. This, indeed, has so arrested school work that many times Mr. Bright, the head master of All Souls' School, has, during school hours, sent for bread and distributed it to the starving lads. And frequently the lad who has brought with him a piece of bread has generously shared it with a school mate more hungry than himself. Another head-master, Mr. Powell, gave me the names of several boys whose absence was accounted for by their want of food. I visited many of the homes, and in every one found the reasons given *bonâ fide*.

In one house in Buckley Street, Ancoats, where

three children attended Every Street Board School, I found two at home and one out. The two at home were minding two babies, and all huddled round the little bit of fire in the grate; there was not a vestige of food of any kind in the house. The father, a file cutter, had been out of work for months; the mother did a bit of charring when she could get it. The father had been out all night, and earned 1s. 6d. for watching, every farthing of which went for rent. The boys had neither shirts on their backs nor shoes on their feet, and their pinched looks and piercing eyes told of long-continued hunger.

Now it is a mistake to suppose that ordinarily a child prefers the street (especially in winter) to the warm, well-ventilated, clean school-room. The whole routine of a modern school is a happy experience to a healthy child. The singing, the physical exercise, the playground with its gymnasium, the lessons, and the surroundings are all calculated to minister to the best instincts of youth; but how each and all of these attractions lose their interest, and from being a pleasure become a terror and a pain, from the fact that nature's claims for food are pressing and paramount! There is only one subject before a hungry child's mind, or at least it takes precedence of every other—that is the wherewithal to satisfy its natural cravings, and if these are not in some measure cared for and provided for, all efforts at the instruction or improvement of the mind will be more or less abortive. Those who have had experience in teaching will bear me out in my statement that the difficulties of tuition increase, as the last minutes of the school hours drag their slow length along. We have failed to estimate the large quota of human nature in school-children, and this department needs a constant supply of fuel to keep up the steam at the standard of high-pressure, now demanded by the requirements of the Public Elementary Education Act.

While drink is the primary cause of three-fourths of the destitution in our midst, I may be permitted to cite a case where, from a variety of causes, poverty overtakes a family and the ability to rise above it seems to be denied them:—On Nov. 24, a Mrs. Gilbert came for a recommendation for a child who was ill. We had had four of her children at our penny dinners for near a month, and I at once returned with her to her house to verify the story of her troubles. I found her husband, a man about thirty, lying on a truckle bed with a couple of potato bags covering him, and in great agony from bronchitis. On the Saturday previous, the aged grandmother had, out of her penury, spared the family 3d. for food. Sunday passed, but no food. Monday, a few stray crusts. Tuesday, they all got relief from our soup-kitchen. The two youngest children were out-patients of the Ardwick and Ancoats Hospital, the third child had a withered arm, which was gradually wasting away. The eldest boy had sore eyes, the result of destitution and want. The father and mother were both sober, steady folk, but thoroughly overborne by the crushing conditions of their cruel fate. I said, 'My good woman, why don't you go into the workhouse, where your poor husband would be cared for, and your children, too, until times mend a bit.' 'No, sir,' she replied; 'we've suffered many a year like this, and we may pull through this one yet. I don't care for myself;

but, oh, sir, it's hard indeed to see five of them cry for bread hours at a time. I've pawned everything—furniture, clothes, even to what my children could ill spare—to tide over, but I'm at the far end now.' These are the short but simple annals of the poor that one sees and hears daily. It is not too much to assert that the midday meal given to such a family as this simply saved the children from premature death, and made it possible for those of them who were of school age to attend with some degree of comfort.

From the first day of our operations, the system of tickets was adopted. These tickets were distributed to the various schools, the teachers being enjoined to exercise every care that only those should have a ticket who could not procure a dinner otherwise. Those applicants who came without tickets were visited at their own homes, and if the circumstances warranted it, tickets were given to the children. This feature of home visitation is of the greatest importance, and is an 'essential' which it would be fatal to the success of the scheme to leave out. The attempts at imposition by the professional spongers and importunate sneaks are so numerous and so barefaced, that nothing short of a rigid system of home visitation will counteract this deplorable tendency. With some of the children, under vicious training and habits, a lie comes quite as pat as the truth, and no other method will meet the case but personal inquiry on the spot. This, of course, entails an immense amount of voluntary labour; but if a given area is marked out into small districts, say thirty houses, a willing worker will always be found to spend an hour or two in home visitation.

We have confined our attention to a good, warm, wholesome, midday meal given at one o'clock, fifteen minutes after the dismissal of the schools. The dinners are given in a room measuring 40 feet by 20 feet, with tables placed across. The elder children stand, and the little ones sit on the floor. Our dishes are of tin and spoons of tinned iron. I am sure if I had to refurnish I would have the dishes of earthenware, as the tin dishes rust and become offensive. To-day, Jan. 8, the dinner was Scotch broth, and to make 60 gallons, quite sufficient to serve 240 children, the recipe was as follows:—

12 lbs. ox-head at $3\frac{1}{2}d.$	s. d.
6 „ marrow bones at $1d.$	3 6
10 „ carrots at $\frac{1}{2}d.$	5
4 „ turnips at $\frac{1}{2}d.$	2
Four cabbages.....	5
Sweet marjoram, $2d.$, thyme, $2d.$...	4
Parsley, $2d.$, leeks, $9d.$	11
$\frac{1}{2}$ a peck of fine oatmeal.....	9
Salt and pepper.....	3
	7 3
12 4 lb. loaves at $4\frac{1}{4}d.$	4 3
	11 6

This will make 60 gallons of soup, and with the bread is ample for 240 children; the cost 11s. 6d., with wages, 4s.—viz. 2s. 6d. for cook, and 1s. 6d. for assistant, making 15s. 6d.—i.e. $3\frac{1}{10}$ farthings per head. This regimen is varied daily with pea soup, but the cost is about the same.

I conclude by appending the opinion of the head master of our largest Board School, which seems conclusive as to the necessity for such efforts.

Board School, Every Street, Manchester,
Dec. 12, 1884.

Dear Sir,—On behalf of the poor children attending this school, I beg that you will accept my most heart-felt thanks for your kind efforts in organising the system of 'penny dinners.' It is astonishing what an improvement has been effected in the appearance and intelligence of some of our poorest scholars, during the six weeks that they have been able to procure one good meal a day. Boys who were miserable-looking, restless, and wandering, six weeks ago, are now cheerful and attentive. The work of the Standards needs no over-pressure on boys who are fed, but a very small amount of mental effort proves too much for an empty stomach. The fact that we have in this school, generally between two and three hundred children whose fees are remitted by the Board affords a means of forming an approximate idea of the amount of nourishing food within the reach of many in this district. The education problem would be easy of solution if it were not for the difficulty many experience in procuring food; but nothing can be done by way of training children whose stomachs are in a chronic state of emptiness. It is not only hunger that these poor waifs have to endure, but the condition bred of hunger makes them lifeless and insipid when at play, and inattentive and dull when at school.—I am, your obedient servant,
C. POWELL.

Alex. Forrest, Esq.

THE PENNY DINNER MOVEMENT IN BIRMINGHAM.

(FROM A CORRESPONDENT.)

THE penny dinner question has aroused some little interest in Birmingham, where there are thousands of children who scarcely know what it is to taste meat from one week's end to another, and various attempts have already been made at providing at as little cost as possible dinners of a nutritious, substantial, and sufficiently abundant character for the poor children attending the Board and denominational schools. It cannot and should not be overlooked that it is the first duty of parents in all cases to provide proper sustenance for their children, and as dinners good for anything cannot possibly be supplied at an inclusive cost of one penny per head, either great care should be exercised in order that careless and thriftless parents are not relieved of their proper responsibility while in a position to discharge it, or the prices charged should be such as to cover the cost—say $2d.$, $2\frac{1}{2}d.$, or $3d.$, an exception being made in respect of cases where the want is real and genuine; such, for instance, as a family of four or five having to subsist on 7s. or 8s. per week, a state of things which prevails in and around Birmingham to a greater extent than many people imagine. In these cases, rather than the children should starve, a system of remission in whole or in part, such as obtains in respect of school fees, would be found practicable, and could be worked through the same channel by which the remission of school fees is regulated. However it be done, if such a movement is to be a real boon to those most in want of it in a town like Birmingham, it will have to be carried on by voluntary effort, and be occasionally

outside contributions as well. There is about the need for something of the successful it requires to be carried out in a roughly business-like, systematic way, that of a well-considered, comprehensive

successful attempts in the penny dinner have been made in Birmingham during the four weeks. To Mrs. Birt Davies Cole, of the former proprietor of the Acorn, goes the credit of the first practical experiment. During last month a large rear of the hotel was fitted up, and the arrangements made for supplying a dinner for some two hundred of the poorest ending the schools connected with St. Mary's, St. Chad's, and Christ Church. One penny was made, and the tickets issued to the children at their respective schools. On the first day (Dec. 8) the children had between a pint of soup and four ounces of twelve ounces of peas-pudding. To each one dish was served at each end of the table, that the soup eaters, who were largely of the poor, were at one end and the pudding eaters at the other. The soup was composed of potatoes, onions, pearl barley, and beef bones. This set was quickly followed, for on the next day succeeding the successful inauguration of the above movement a committee of some ladies and gentlemen interested in education started an experiment of the same kind in connection with the Board Schools of the city. A penny dinner at the Summer Lane School, about 300 children, under the supervision of Mrs. R. W. Dale, wife of the Rev. Dr. Dale, well-known pastor of Carr's Lane Chapel. The Board Schools contain about 2,000 children, and a dinner centre in themselves. The children in their customary places, without being allowed to leave their discipline which obtains in the school hours, and the soup or other food brought to them. About half an hour is allowed for the meal, after which grace is sung and the children are dismissed to the playground till the next day. As much variety as possible is introduced in the bill of fare, of which the following may be taken as an example:—Tuesday, Irish stew; Wednesday, milk soup; Thursday, roly-poly meat and potatoes, lentil soup, followed by bread and butter, fig-pudding, rice pudding, and a portion of jam for treacle, are also down on the programme. Some useful hints have been given by the committee in the preparation of the dinner from the little pamphlet published by Mr. Moore Ede, rector of Gateshead-on-Tyne. The recipes he has given have not been followed in all cases, some of the ladies on the committee having sufficient practical knowledge to improve upon them. There is, of course, a little difficulty in pleasing all tastes. For instance, when the dinner consisted of a palatable dish composed of milk, water, and sugar, it was evident some of the children were displeased with it. One little girl, asked if she liked her dinner, replied in the negative. On being asked what she thought of it, she said it was not a palatable air of having made up her mind to eat it; while another girl gave as the reason for her dissatisfaction that onions had been put in it instead of peas. Many children, it is said, have an aversion to onions, unless they have

been so well boiled that their pungent flavour is destroyed. And on this occasion there seemed to have been a slight mishap in the culinary department which would doubtless not be allowed to occur again. All these little matters will, of course, be obviated as experience is gained, and meanwhile the demand for tickets proves the popularity with which the movement is attended. The committee having charge of arrangements includes several members of the School Board and a number of ladies connected with the Ladies' Useful Work Association. Mr. Osmond Airy is the chairman, Mr. George Dixon and the Rev. Canon Bowlby are vice-chairmen, and Mr. G. H. Kenrick, of Maple Bank, Edgbaston, is treasurer. Three centres have been started, with a sub-committee for each. They are at Summer Lane, Mrs. R. W. Dale being president of the sub-committee, and Mr. Silas Cooper honorary secretary; at Gooch Street, for children attending ten Board and denominational schools, Mr. H. J. Ball being chairman and Mr. J. T. Husband honorary secretary; and at Unett Street, for children attending five Board and denominational schools, the Rev. J. J. Dixon being the chairman and Mr. Kimberley the honorary secretary. Provision has been made at each centre for 300 dinners, but if the experiment proves successful this will no doubt be increased, and the movement be extended throughout the town. It is at all events gratifying to find that some of the most influential and best known public men in the town are associated with the movement.

The experiment was discontinued when the schools broke up for the Christmas holidays, and has not yet been resumed, the question whether they can be placed on anything like a satisfactory and permanent basis being under consideration. The actual cost per head was found to be 1½d. per head. A number of tickets were purchased by charitable persons and presented to some of the poorest children, and there was a tendency towards increase manifest in this direction. Whatever the result of the experiment in Birmingham may be, it has been demonstrated that the scheme is practicable, if carried out on some such lines as are indicated at the commencement of this article. It is satisfactory to find that the whole of the preliminary expenses—about 40l.—have been met by donations forwarded in response to an appeal issued through the public press.

THE RECENT TYPHOID EPIDEMIC AT KIDDERMINSTER.—At their December meeting the Drainage and Waterworks Committee reported to the Kidderminster Town Council that the plans and estimates which had been prepared by Mr. E. Pritchard, C.E., for the improvement of the sewerage and the water supply, were under consideration. They were, however, waiting for the report presented by Dr. Parsons to the Local Government Board, relative to his inquiry into the recent outbreak, before coming to a decision thereon. The deaths during the month were 43, giving a death-rate of 21.9, compared with 24.4 in the corresponding month last year. Six of the deaths were from typhoid fever. The medical officer had forwarded to Dr. Parsons a report as to 888 cases of typhoid fever, and there were more to be sent. There were, it was stated, still some cases in the town.

THE AEOLUS WATERSPRAY AND GENERAL VENTILATING COMPANY, of 235 High Holborn, have received instructions from H.M. Office of Works, to apply their complete system of Inlet and Outlet Ventilation, and supply of warm or cold fresh purified air to the Registry Room of the General Post Office (New Building), St. Martin's-le-Grand.

A PENNY DINNER CENTRE.

By MISS E. A. GLADSTONE.

HAVING been asked to describe the penny dinner centre in connection with Edinburgh Road Board School, near Kensal Green, I will endeavour to do so, not for the purpose of holding it up as a model to others, but to show how easily and inexpensively these centres may be arranged.

Our premises simply consist of a front kitchen where the children eat their food, sitting in rows on benches; a back kitchen, with a small range; and a common wash-house, where the chief part of the cooking takes place. The copper serves equally well for making soup or boiling puddings, and if we want an extra quantity of either, we use a large iron pot over the kitchen fire. The cook starts work about eight or nine in the morning, and by twelve o'clock the food is ready for the children. With such accommodation we cannot offer a choice of dishes on any day, but sufficient variety is attained by alternating soup and pudding, and we often suit our provision to the climate of the day, pudding being more tempting in warm weather, while nothing is so much appreciated as hot soup when frost or snow is holding sway outside. It may be well to explain that soup is a comprehensive term for what is called Irish stew; meat and vegetables; meat and rice, &c., in some centres. These different elements predominate by turns; sometimes the soup is founded on potatoes, sometimes on fresh chopped vegetables, sometimes on rice, sometimes on peas, but it is always served in a liquid condition, and eaten in basins. These basins are equally convenient for suet pudding on other days, while large galvanised iron spoons are used, which, though not elegant, are safe and strong and serviceable.

These are two recipes as specimens:—

	s.	d.
Split peas, $\frac{1}{4}$ peck (8 lbs.)	0	6
Rice, 3 lbs.	0	4 $\frac{1}{2}$
Assorted vegetables.....	1	6
Meat (piece of pork or bullock's cheek)..	1	6
Salt, pepper, &c.....	0	2
	4	0 $\frac{1}{2}$

This would make about 8 gallons of soup, sufficient for from 60 to 70 children.

Suet pudding—

	s.	d.
Flour, $1\frac{1}{4}$ peck	2	1
Suetine, 2 $\frac{1}{2}$ lbs.	1	8
Jam, 3 $\frac{1}{2}$ lbs. (half a 7-lb. jar).....	0	10 $\frac{1}{2}$
Baking powder.....	0	2
	4	9 $\frac{1}{2}$

This amount will make four or five large roly-poly-shaped puddings, which we boil in cloths in the copper, and cut up into slices of about an inch in thickness, putting a lump of jam on each. Each pudding may be cut into 14 slices, so providing for from 60 to 70 children. Any pudding left over makes excellent dumplings in the soup.

Of course these recipes may be much varied, but many kinds of food may be arranged which shall cost less than 5s. for seventy children, and the profits of supplying 100 children might cover all the outlay, including wages of cook, fuel, and even expenses of original plant.

The children themselves consider that they get a very fair pennyworth, better than they could get in any cookshop, and testify to the food being 'real foine' and satisfactorily 'filling.' They come into the room in relays, infants having the first turn, as these little people like to plod through their food slowly and deliberately. The boys generally come in with a clatter, and swallow their meal as near the scalding point as they dare, and are quickly off again to join their comrades in games outside, where they need not observe such strict order as we find it necessary to enforce in our room. I ought to mention that every day one or two ladies are in attendance to help serve the children, to keep order, and to receive their payments; and we have the centre open on the four middle days of the week.

THE SANITARY RECORD.

JANUARY 15, 1885.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

Local Authorities throughout the country would confer a favour on the EDITOR of the SANITARY RECORD by forwarding to him all documents relative to Water supply, Sanitation, and Health matters generally, which come under their notice. He would also be glad to receive reports from Engineers of Waterworks, Sewerage Projects, and Domestic Drainage Improvements for notice, comment, and illustration.

THE HEALTH EXHIBITION AWARDS.

So fickle is the public mind, that the wonderful show which drew all the world to South Kensington last year has probably passed out of the memories of most of those who were connected with the exhibition only as admirers and wonder-gazers. The really serious part of the extraordinarily varied collection of objects that were gathered together in the Horticultural Society's grounds—viz., the judgments that were pronounced upon the exhibits by the jurors appointed by his Royal Highness the President, interested the world for a morning and an afternoon, and then had to make way for newer and fresher objects of curiosity. It would perhaps in any case be idle to expect that the public at large would manifest any very great enthusiasm as to the decisions of experts on the comparative merits of the several exhibits; but labours so onerous and protracted as those of the jurors ought certainly to have received more general public recognition than seems to have been given to them.

One reason why so little interest has been evinced in the matter is the unsatisfactory and imperfect manner in which the awards have been made known. There is no special reason that we can see why the adjudications, sent in by the juries in almost every case before the end of August, and finally settled by the Jury Commission in the early part of October, should not have been published in time for the public to be able to compare side by side, with their own eyes, the different exhibits of the same class, from which they might chance to be desirous of making a selection. And there is, in our view, still no justification for the publication in the first place of so bald a schedule of awards, and for the subsequent extraordinary delay in issuing the more definite list which was its necessary complement. The original list, published in a *London Gazette* at the end of October, and reprinted by the Jury Commission, contained only the class, the name of the exhibitor, and the nature of the award. Now there was here an omission of which the unopulous exhibitor was not slow to avail himself. Though the jurors were enjoined to state specifically the particular articles which they considered deserve recognition, the *London Gazette* simply announced that such and such an exhibitor had received a gold medal in Class 509. What more natural than for the enterprising manufacturer to feel his entire collection of exhibits as crowned with laurels at the hands of a discriminating jury? Whereas the fact was—though the world did not know it till two months later—that only one particular apparatus or exhibit shown by our friend the gold medallist had received any award at all. Early the fuller list of adjudications, which was for some inscrutable reason delayed in publication till Christmas time, ought to have been published when the earlier list was; ought, indeed, to have taken its place.

But even this much-delayed second list is unsatisfactory. It divides the awards into the several classes of gold, silver, and bronze medals, diplomas of honour, and certificates of thanks, and under each of these heads ranges the recipients of medals, &c., in alphabetical order, with a note of the class under which they exhibited, and the particular exhibit receiving an award. It is, however, absolutely impossible for anyone who does not make an index for himself to find out from this pamphlet what were, in the eyes of the jury, the comparative merits of the several exhibits in a particular class. Surely this is all-important. A person anxious to make a selection of a particular piece of apparatus may be bewildered—probably is plunged into unathomable despair—by the overwhelming merits which the prospectus of each individual maker shows to appertain to all his goods. A reference to the awards of the International Health Exhibition might save him this anguish, if the official pamphlet were arranged in proper form; but it is not. And so, for the behoof of all and sundry who may wish to have an intelligibly compiled abstract of the final results of the Exhibition, we have had the list of the awards of our own prepared. This will be published immediately—it could not be brought out before for the reason already stated—the final number of our popular 'Exhibition Record,' to which it will form a fitting pendant.

This labour has been undertaken not only because a great number of our subscribers have been clamouring for an understandable list of awards,

but because it seems to us of importance that the adjudications of the juries should be accurately and precisely set forth for general information. Our revised version of the awards will therefore be arranged under classes. The gold medallists in each class will be given in alphabetical order, then the silver medallists in that class, then the bronze medallists, and afterwards the non-competitive recipients of diplomas of honour and special certificates of thanks in the same class. The precise address of each medallist, &c., is given, and the country under which the exhibit is grouped, e.g. France, Italy, &c.; and last, and most important, the particular exhibit for which the award is made. It would obviously not be fitting to say more of this supplement here; but we shall be disappointed and surprised if it is not found vastly more useful and practical for ordinary wants than the official publication of the Jury Commission.

CUTTING OFF WATER FOR NONPAYMENT OF RATES.

WE have already called attention to the power which the Water Companies possess, under the General Waterworks Clauses Acts, of cutting off the supply if their rates are not paid. Many people think that this is a power which should be taken away; and others that the companies should not be allowed to put it in force where the amount payable is in dispute. The power, however, exists, and the companies are by law enabled to cut off the supply where their charges are not paid. If they were ordinary traders, no one could deny their right to discontinue the supply of goods to a customer who did not pay for those he had previously had. They are, however, monopolists who carry on business under conditions prescribed by Parliament. One of those conditions is that they have the same right as an ordinary trader, to cease supplying a customer who will not pay, and they have lately shown that they are disposed to insist upon this right. The fact that a consumer asserts his water bill to be too large, does not exempt him from the liability of having his supply cut off if he refuses to pay. The Courts have recently refused to grant injunctions restraining the companies from the exercise of their powers in this respect, and have told the discontented consumers to take their statutory remedy of getting the assessment settled by two justices (or a stipendiary magistrate). Of course, if a company demanded excessive rates and cut off the supply for nonpayment, they might be liable to pay damages for so doing; but they cannot be restrained from cutting off the supply, by reason of a dispute as to the amount payable. One case in which the injunction was claimed and refused has had a curious termination. Refused the remedy he asked, the ratepayer at last went before a magistrate to have his assessment fixed. He ought, as we have frequently pointed out, to have taken this step in the first instance, but he preferred trying legal experiments instead. The magistrate's decision was that the company's valuation was right, and, as a consequence, it now appears that there was no overcharge, and therefore no reason, moral or legal, why the supply should not have been cut off in consequence of the nonpayment of the bill. This may not always be the case, but even where the charge is excessive, the proper course is to pay, *under pro-*

test, and, when the valuation is settled, to claim back the difference from the company. An aggrieved ratepayer may like to pose as a martyr, unable to wash because a tyrannical company refuses to supply him with water for which he will not pay; and, if he has only himself to consider, there is no great objection to his adopting this *rôle*. It is true that, if his premises remain long without a water supply, they may become a nuisance, to which his neighbours may reasonably object; but this is perhaps only a minor consideration. In many instances, however, where payment of rates is disputed, the ratepayer is not himself the only consumer. Where the houses are small, or are let out in separate rooms or tenements, the landlord pays the water-rates, as he pays the poor-rates, in a lump, and charges his tenants a rent calculated so as to recoup him this outlay, as well as to give a payment for the use of his property. In such cases the occupiers who use the water are not parties to any dispute as to its price, but, if it is cut off, they, and not the landlord, are the sufferers. This is not an imaginary grievance. Instances have occurred of water being cut off from houses densely crowded with poor inhabitants, because their landlord would not pay the water-rates. In such cases the public health is almost certain to suffer, and a nuisance to be created; and in times of epidemic, the probability of its spreading would be greatly increased. The tenants, who pay their landlord for water which he prevents their having, have, no doubt, a right of action against him for breach of contract. But the damages recoverable by any individual would usually be but small, and the chances of an action being brought to enforce their rights, are consequently so remote that landlords are not deterred by considerations for their tenants' convenience, when questions of reducing their own water-rates are raised. In such cases, where the cutting off of a water supply is likely to injuriously affect the health of several people who are no parties to the dispute, it is the duty of the local authority of the district to interfere, and if necessary, to restore the supply at the expense of the landlord. The inspector of nuisances ought to detect such cases, and put the local authority in motion. But any person who is aware of the facts may, and should, also inform the local authority; and if he is a ratepayer of the district and so a person aggrieved, may also inform the Local Government Board, and so oblige the local authority to exercise their powers for the protection of the health of the community.

VENTILATION OF PUBLIC BUILDINGS.—Messrs. Robert Boyle & Son, Ventilating Engineers, 64 Holborn Viaduct and Glasgow, are at present applying and have applied their self-acting air-pump ventilators and system of ventilation to the new Tabernacle, Auckland, New Zealand, being built for the Rev. Mr. Spurgeon; St. Andrew's College and Asylum, Algoa Bay, Africa; Waddesdon Manor, residence of Baron de Rothschild; Aston Clinton, Tring, residence of Lady de Rothschild; Crig-y-nos Castle, Wales, residence of Madame Adelina Patti; Wilton House, Wilton, residence of Lord Pembroke; residence of the Duke of Cleveland, Bath; residence of Earl Grey, Howick; Euston Hall, Thetford, residence of the Duke of Grafton; new Post Office, Boston; Reform Club; Delph Literary and Scientific Institute, Ebbw Vale, Mon; St. Pancras Workhouse; County Police Station, West Hartlepool; New County Court, Nottingham; new hospital, Douglas, Isle of Man.

HONEY AND ITS ADULTERATIONS.

In a lecture at the Conference of the Beekeepers' Association, Mr. O. Hehner, after describing honey as a mixture of water, dextro- and levo-glucose in certain proportions, pointed out that the presence of pollen grains and other colouring and odorous matters derived from flowers, gave to the honey the most diverse tints and flavours, and that when the abundance of any particular flowers, as clover, beans, limes, or heather, enabled the bees to indulge their well-known habit of keeping to one source at a time, the resultant product was as capable of recognition as was any vintage or description of wine.

Cane sugar, by treatment with an acid, yields a syrup almost identical with honey, though of course wanting its delicate aroma and flavour; but for several reasons, especially its cheapness, its lesser tendency to crystallise, and its not possessing the intense sweetness of cane sugar, starch syrup, which is largely manufactured in America for more legitimate purposes, as brewing, &c., is almost exclusively employed as an adulterant.

Of forty-two samples submitted to analysis by Mr. Hehner, twenty-six were avowedly English, nine American, four Swiss, two French, and one Transylvanian. The three last-named and twenty-four of the English were genuine, but only two of the American. On the other hand, all the Swiss, seven of the American, and two of those sold as English, but which he believed to be really American, were adulterated. Nor were these the lowest priced, for while perfectly pure English honey can be had at 6d. per lb., some of the Swiss cost as much as 1s. 3d. The practice of adulteration is favoured by the popular notion that good honey should be always clear and fluid; and though no prosecutions have as yet been undertaken, the manufacturers usually employ such descriptions as 'prepared,' 'fine table,' or 'Swiss' honey, just as the vendors of adulterated coffees call them 'prepared,' or 'French,' with a view to evading the law.

It is possible that the food value of corn syrup may be as great as that of honey, but the fact that bees refuse to take it until driven by hunger and then generally die of diarrhoea, makes even this doubtful. Still they are not honeys, just as an artificial mixture of spirit, water, tartaric acid, and colouring matter, is not wine; and in calculating the value of any human food, we must take account, not only of chemical composition, but of those vague and undefinable qualities due to minute traces of undetermined bodies which impart flavour and odour, and exert a stimulating action on the sensory nerves. Clover, bean, heather, &c., honeys are as distinct in their character as Bordeaux, Burgundy, and Rhine wines; and if the public taste could be educated to appreciate them, floral designations would be at least as attractive as the meaningless and delusive terms now in vogue.

SMALL-POX is still rife in the county of Durham; at a special meeting of the Brandon Local Board, Dr. W. C. Blackett, the medical officer, reported an alarming outbreak at Langley Moor, where at that time there were upwards of twenty cases. Through the instrumentality of the vicar of Brandon two Sisters of Mercy had been engaged to nurse the patients. At the last monthly meeting of the Durham Rural Sanitary Authority, Mr. C. A. Bell gave notice that at the next meeting he would move a resolution that a proper hospital be provided at once for infectious diseases.

NOTES OF THE MONTH.

DANGEROUS FIREPLACES.

A HOUSE was lately burned down at Liverpool owing to some cinders or sparks finding their way through a crack or defect in the hearthstone, and thus reaching the woodwork of the floor. There is no doubt that fires occur in this manner more frequently than is generally suspected, but at the same time it may be said that occurrences of this kind should be of the preventable class, as it is owing to a wanton neglect or avoidance of ordinary care in building, and, in fact, it is a contravention of one of the fundamental provisions of the modern Building Act or of the Local Board rules in force. These rules demand that such hearth or slab shall be of stone, slate, or other incombustible substance, and shall be laid wholly upon stone or iron bearers or upon brick trimmers, and shall be solid for a thickness of seven inches at the least. The simplest and most convenient method, and therefore generally in use, is to turn a brick trimmer, or flat arch, 18 inches wide, under the hearthstone and concealed in the thickness of the wood floor; and as it is also enacted that such hearth shall be wholly bedded on an incombustible material, the haunches of the arch are usually filled in with concrete to form a level face to receive the hearth or slab. It therefore follows that if a defect should arise in the hearthstone itself, and any ashes or sparks should find their way through any such aperture, the danger is arrested by means of the brickwork or concrete with which the sparks come next in contact. If this legalised construction is adopted and carried out in a workmanlike manner there can be no excuse for casualties of the description reported, and it is gratifying to know that builders are sharply looked after by the district surveyors, or those in authority, and although their vigilance is occasionally evaded, such mishaps now-a-days are reduced in number; and when it is remembered how many fireplaces exist in an ordinary house, the only wonder is how successfully these scamped constructions are minimised. Antiquity can hardly be advanced as an excuse for careless builders, as the Act of 1774 specifies a very similar sound construction, and, indeed, the fear of fire animated the framers of the Act throughout, as it is described as an Act *for the better regulation of buildings, and for the more effectually preventing mischiefs by fire within the Cities of London and Westminster*, and herein perhaps lies the difficulty, as it was not until many years later that the provinces and country towns took their cue in this respect from the metropolis, although a Building Act was passed in 1667, as a result of the Great Fire. Another recent instance of neglecting ordinary precautions may be noted in a house at Notting Hill, built within the last twenty years, where the flames from the fireplace made their way into the room through the chimney-jamb or sides. These are specified to be at least one brick thick, *i.e.* about nine inches, but there are bricks and bricks; a soft, ill-burnt brick will soon crumble away if not protected, and a violent stirring of the fire may complete its downfall, and bring the flames in contact with the adjoining woodwork. These points, though apparently slight, and the danger being covered by a coat of plaster, have an unpleasant way of forcing their importance upon the uninitiated, and the grievance is the greater as the

householder has no real remedy, and as a rule no responsible party to proceed against, if even it were worth while to do so. An unfortunate case, bearing upon this in a measure, may be cited. It was brought before Mr. Justice Field and a common jury not very long since. The plaintiff occupied a house in Bayswater, and the defendant one adjoining. The defendant's chimney caught fire, and at the same time a fire broke out in the plaintiff's house on the drawing-room floor. It appeared that the houses were built about twelve years ago by the same owner, and that a half-brick had been left out in the flue just under the joists of the plaintiff's drawing-room, and by this neglect the fire had made its way through the aperture. When, however, it was stated in evidence that the aperture was in plaintiff's wall, and that his neighbour could not by reasonable examination have discovered it, it was admitted that the action could not be supported. It will thus be seen how much depends upon a little care and common-sense precaution in the construction at the beginning.

THE BOUNDARY COMMISSION.

It is refreshing and delightful to find the work of a Government Department done in a business-like and practical fashion; and, in common we suppose with most people, we have been agreeably surprised at the favourable manner in which the proposals of the Boundary Commissioners for the redistribution of electoral districts have been almost everywhere received. It is worth while pointing out, however, that the real difficulties—those, namely, in which the wishes of the great manufacturing districts of the North are concerned—have yet to be grappled with; and the Commissioners have been cautiously feeling their way in these districts, by sending in advance their Assistant Commissioners to feel the local pulse as to the divisions of towns which appear most generally suitable. The work of the Commission has certainly been got through with admirable promptitude and despatch; but we shall still be greatly surprised if they are within sight of the end of their labours when Parliament resumes. There is one point to which reference may properly be made at this juncture, though its interest is prospective only. Students of the redistribution scheme will probably have observed that municipal and Parliamentary boroughs are proposed by it to be made conterminous, which is not always the case at present. This unification of the limits of the municipal and Parliamentary borough has apparently been regarded by the framers of the Bill as a principle; but they have forgotten that the restless ambition of Town Councils is for ever tending towards the enlargement of their borders. Every year one or another of our great towns becomes greater still in the matter of superficial area, through the absorption of outlying suburbs. The municipal borough of Bradford, for instance, has been twice extended, the last occasion being in 1881. The Parliamentary borough of the same name has remained as it was, so that its population is now 15,000 less than that of the municipal borough. The new Redistribution Bill proposes to make the two conterminous. But, suppose the Town Council of Bradford, a year or two hence, folds other districts to its ample municipal bosom, how will the Parliamentary borough fare then, if its unity with the municipal borough is to be regarded as a principle? Will it

expand by automatic process, will it remain unexpanded, or will new redistribution, on a microscopic scale, be every now and then be necessary to readjust boundaries? The selection of one from the proverbial three courses above suggested we leave to any of our legislators who may be interested in the question.

THE SMOKE NUISANCE AT OLDHAM.

THE town councillors of Oldham have been much exercised in mind regarding the smoke nuisance arising from some of the factories, but the proverbial wisdom among a multitude of 'councillors' is conspicuous by its absence. At a meeting of the Sanitary Committee, when the facts were *again* laid before the conscript fathers, it was decided to defer the question once more, and it was also suggested that the smoke inspector, amongst others, should be discharged, although he had made a number of observations and tabulated them carefully. To discharge an official who had done his duty, be it observed, because the authorities had failed to do their portion of the work, is, to say the least, uncalled for and premature. In the metropolis, as we have often pointed out, the authorities, acting under the Smoke Abatement Act of 1853 (amended 1856), carry out their duties effectively and with great vigilance, and the same may be said of some of the provincial towns, notwithstanding the many difficulties in the way. A furnace fire when first lighted, and when replenished, must necessarily emit a considerable amount of smoke, and to meet this unavoidable fact a short time is allowed for the fire to become clear, or comparatively so, and the following saving clause also appears in the Metropolitan Act:— 'Provided always, that the words "consume or burn the smoke" shall not be held in all cases to mean "consume or burn all the smoke," and that the justice or justices before whom any person shall be summoned may remit the penalties enacted by this Act, if he or they shall be of opinion that such person has so constructed or altered his furnace as to consume or burn as far as possible all the smoke arising from such furnace, and has carefully attended to the same, and consumed or burned as far as possible the smoke arising from such furnace.' The time referred to varies generally from five to twelve minutes, this latter being apparently the grace which is allowed to the Oldham manufacturers; but, in spite of this limit, the owners of the objectionable chimnies seem to think they are entitled to a run of half an hour, and one sapient member implied that any interference with their selfishness will cripple their trade and drive it from the town. It is obviously wrong to entrust the sanitary regulations of a town to those who are afraid to put in force the proper legislative action, and the sooner an impartial administration is effected the better for the general good, and also for the individual malcontents, in spite of their short-sighted policy. By the use of anthracite coal a great deal of smoke may be avoided at the outset, and a good stoker may, without any apparatus or specially constructed furnace, considerably diminish the nuisance; and, bearing upon this, an Engineer's letter to the *Times* on this burning question, on a small scale, however, may be quoted. 'There are among the varieties of coal two distinct types. The so-called smokeless coals have their carbon in large and gases in small proportions; their structural appearance is crystalline, from having been more or

less coked during some freak of nature. As they require more oxygen when burning than other coal, from their excess of carbon, they send up the chimney proportionately larger volumes of nitrogen and carbonic acid, both of which, being invisible, escape the name of smoke. That they require a great draught is the unscientific expression for a large supply of atmospheric air; they may smoulder with less, but will not burn without it: hence they are rarely suitable to our liking in existing grates. House coal, from being of a laminated structure, is the other type. Its carbon is in smaller and gases in larger proportions. The laminated form of house coal can be used to good purpose, since it presents well-defined faces, which are the front and back of the coal as it was in the coal measures, and also shows ends where it was broken off. Now, if either face of a lump be tapped with a hammer in the coal-cellular, it will open out without loss into shaped pieces, suitable for being put on the fire; but if it be struck random blows it may be smashed up into odd bits, which, being pitched on the fire in a haphazard way, burn as best they may, when unnecessary soot is the consequence. Or, better still, put the lump on hot embers at the end of the fire with a face downwards, and in a minute or so the upper face will be seen to split along the laminae, when with a gentle tap it falls to pieces, and, igniting with the best advantage, may be spread.'

It will have been seen that offenders are not treated with undue harshness, or want of notice, and being in possession of various ways and means of doing right, it rests very much with themselves as to whether they are open to conviction, mentally or legally.

POPULAR APPRECIATION OF INFECTIOUS HOSPITALS.

WE have recently recorded in these columns several gratifying instances of the growing appreciation by the public of the utility of infectious hospitals. Writing to the sanitary authorities of the Gloucestershire Combined District, Dr. Bond observes that the hospital at Cirencester affords ample proof of the fallacy of the statements which the opponents of these institutions are so fond of urging, that patients cannot be got to enter them, and that parents especially will not allow their children to be taken to them. During the past year the hospital had a more severe strain put upon its resources than in any previous year, twenty-five cases having been admitted to it, and of these more than half were under twelve years of age. The period during which the patients remained in the hospital varied from nine to forty-five days, with an average of 26.4 days. In no case was anything charged beyond the bare expense of food; medicine and medical attendance being debited to general establishment charges, which are divided between the two authorities (poor-law and sanitary) in agreed proportions. The total cost of the patients was 49*l.* 11*s.* 7½*d.*, which gives an average cost per diem of 1*s.* 4½*d.* The total amount charged to patients was 6*l.* 12*s.* 2½*d.*, and 27*l.* 1*s.* 1½*d.* was charged to the urban sanitary authority, from whose district all the patients were received, the remainder being paid by the board of guardians of the whole area. Certainly, as Dr. Bond observes, money could scarcely be spent better than this. It is especially to be hoped that this evidence may not be without its influence upon

oration of Gloucester, who, for some un-
derstandable reason, cannot be prevailed to unite
the local authority for the erection and main-
tenance of a joint hospital.

THE PARASITES OF FISH.

Attention with the 'mackerel scare' of last
year is somewhat remarkable that a similar
case of the same season of the year should have
occurred at Madras. The agitation became so
great that the Government determined upon
investigation into the subject, which was en-
trusted to Dr. M. C. Furnell, the deputy sanitary
officer of the province. Upon making in-
quiry, Dr. Furnell was unable to trace a single case
arising from eating fish; and he attributes
the agitation principally to sensational newspaper para-
graphs and the somewhat hasty conclusion of
officials. Appended to the report is a list of
fish which infest fish, and Dr. Furnell dis-
cusses how it happens that these are
transferred to mankind, who, in India,
are large fish-eaters. He thinks that there are
three, obvious answers to this question.

The parasites are generally found in the
intestines, and more frequently in the free
space outside the viscera, between that and the
peritoneum, not so often in the fish itself. They
are not unfrequently found in the flesh, but
usually in the coats of the intestines; and it is
not uncommon for even the lowest classes to eat fish
which are thrown away and the entozoa with
the life of these entozoa (with the exception
of the filaria or thread-worms), when once
removed from fishes, is very feeble. Water raised to
the boiling point effectually kills them. Careful ex-
periments have shown that even in cysticerci (beef
tapeworms) when exposed for five minutes to a
temperature of 135° to 140°, life becomes absolutely
extinguished. Dr. Furnell found that much less than this
temperature most entozoa. All the soft paren-
chymatous tissues die when removed from their
natural environment and put in fresh water to await their turn for
examination under the microscope. In an hour,
or in considerably less time, all signs of
life are departed. It is not, therefore, very
difficult that even simple cooking renders them
harmless. It is possible also, though on this point
Dr. Furnell writes with diffidence, that the fish
do not find man a congenial territory for
development, or unquestionably more cases would
be noticed.

NOTIFICATION OF CASES OF MEASLES.

MR. ISWODE CAMERON, in his last report on
the subject, repeats a plea he made some time ago
for compulsory notification of cases of measles.
He points out to the Town Council,
that ample power to require this under their
Sanitary Act, that measles is a disease very difficult to
eradicate once gets a fair start, and it is a disease
in which a very great amount of culpable negli-
gence in the matter of disinfection exists. The fact
that deaths have happened in one year in Hud-
borough sufficiently shows how very fatal it may be.
He does not ask his authority to depart from the
usual practice of declining, except in very

special circumstances, to take cases of this disease
into hospital. The children usually affected are too
young for this; but there are many means that can
be adopted at their own homes, such as separating
the sick from the healthy, the careful disinfection of
the house and the patient's clothing, the prevention
of other members of the family from attending
schools and the like, which would help to keep this
disease within more reasonable limits. When an
epidemic occurs, the sanitary officials are almost
powerless to cope with it; but, if they had information
of the cases as they arose, much might be done to
prevent the disease from ever assuming an epidemic
form. The outbreak of last year emphasized the
belief that an epidemic gathers virulence as it ex-
tends; it began mildly, and as the number of cases
increased the proportion of fatal cases amongst them
increased also. If, therefore, the disease may be
prevented from becoming epidemic, it may, by the
same means, be kept less virulent. Most cases are
not attended by a medical man, and the householder
will himself be bound to report, so that no cost will
be entailed. Dr. Cameron regrets that this course
was not adopted last year, and proceeds to show
how he dealt with the disease in its absence. Nearly
200 houses were visited in one portion of the town
where the disease was most violent, and disinfectants
distributed with instructions how to use them. The
school authorities were communicated with, and
their co-operation obtained in preventing the attend-
ance of children from infected houses. It is only by
taking such measures very early that any great good
can be expected to result. Once measles has ob-
tained the upper hand in a crowded neighbourhood,
little can be done to arrest its spread. There is no
question but that the notification of cases of this
disease would be of immense utility to health-
officers in their efforts to stay the spread of infection,
especially as the disorder, like other zymotic com-
plaints, is regarded as a trifling illness, and as
inevitable to childhood as dentition.

PURITY OF MILK.

THE following circular has just been addressed to
all cowkeepers and milk-dealers delivering milk from
the rural districts into the city of Coventry:—
The Dairies, Cowsheds, and Milkshops Order, 1879.—
Jan. 9, 1885, St. Mary's Hall, Coventry.—Sir,—As
you sell milk in Coventry, and it concerns the public
health here to know that all milk brought into Coventry
comes from dairies in which sanitary requirements
are observed, I am instructed by the sanitary com-
mittee of this city to inquire, for their satisfaction,
whether your dairy is registered under the Dairies,
Cowsheds, and Milkshops Order, 1879. A note or
certificate from the sanitary inspector of your dis-
trict addressed to me would be sufficient. Your
obedient servant, FREDERIC BOOKER, Inspector of
Nuisances.

SANITARY MATTERS IN AUSTRALIA.

YOUNG communities like the Australian colonies
ought not to show such heavy death-rates as Euro-
pean countries, which are only now and with diffi-
culty working down the accumulated sanitary arrears
of centuries. The last recorded death-rates of these
colonies are unduly large when their circumstances
are taken into consideration, and some of the towns

especially seem to need thorough overhauling. From the last report of the Central Board of Health of South Australia we extract the following figures as to the death-rates:—New South Wales, 16.03 per 1,000; Queensland, 17.99; Victoria, 15.31; South Australia, 14.55; Western Australia, 14.16; Tasmania, 15.79; New Zealand, 11.19; City of Melbourne, at least 17.9 per 1,000, and more if our English method of calculation were adopted; City of Adelaide, 19.93 per 1,000. The sanitary administration of this last town by its local board appears to have been scandalously bad, and probably the same thing would have to be said of other capitals. Our antipodean cousins will evidently soon have to learn the lesson that has been so easily acquired by certain of our municipalities here of raising 'loans for sanitary purposes.'

THE PURIFICATION OF WATER.

At the last meeting of the American Franklin Institute, Dr. William H. Wahl, the secretary, alluded to the experiments that were being conducted under the direction of Chief Engineer Ludlow, of the Water Department of Philadelphia, with the object of purifying the water supply by a system of artificial aeration. These experiments had proved very encouraging, and promised to yield important practical results. The plan employed, which is that suggested by Dr. Albert R. Leeds, differs from others that have been employed for a similar purpose. Laboratory experiments made by Dr. Leeds indicated that the advantageous action of atmospheric air in modifying and, in part, removing the impurities of water in contact with it, was greatly increased by producing the intermingling of the two fluids under pressure. The greater the pressure the greater is the absorption of oxygen, and consequently the greater the reduction of the impurities. The precise measure of this increase has not yet been ascertained. In order to try the experiment on a larger scale, and in such a manner as to afford some evidence of its value in practical operation, one of the Fairmount turbine engines (No. 8) was altered so as to convert it, in part, into an air-pump, by simple mechanical artifices unnecessary to describe. The result reached by the action of the pumps thus modified was the delivery of about 20 per cent. by volume of free air into the water discharged into the main, this proportion being that which had been shown by experiments of Professor Leeds to be sufficient to surcharge the water.

By subsequent comparison of samples of water from the Fairmount pool taken into the pump, and of the water discharged into the Corinthian basin after passing through 3,600 feet of main, the results of the experiment were made apparent. The percentage of oxygen in the aerated water was 17 per cent. greater than before; that of carbonic acid was 53 per cent. greater; and that of the total dissolved gases 16 per cent. greater. The percentage of free ammonia was diminished to 1.5 of its former amount. The percentage of free oxygen represents the excess over and above what was required to effect the oxidation of the organic impurities. These results are most favourable, and point clearly to the entire feasibility of reducing the percentage of organic matters contained in water unduly contaminated with sewage, within the limits of safety.

THE PUBLIC HEALTH DURING DECEMBER 1884.

THE mean temperature during the month of December at the Royal Observatory, Greenwich, was 40° 8'; it was 1° 7' above the average December temperature in one hundred years, and exceeded that recorded in the corresponding month of either of the two preceding years. An excess of temperature prevailed on fifteen days of the month, while during the other sixteen days it was below the average. The warmest day of the month was the 6th, when the mean was 52° 0', and as much as 9° 3' above the average; the coldest day was the 30th, when the mean was only 33° 0', and 5° 5' below the average. Rain was measured at Greenwich on eighteen days during the month, to the aggregate amount of 2.5 inches, which exceeded by half an inch the average December rainfall in sixty-one years. During the year 1884 the rainfall did not exceed 18.0 inches, which was less than that recorded in any year since 1864 (when the amount was only 16.5 inches), and no less than 7.3 inches below the average annual rainfall in sixty-one years. As one inch of rain represents a weight of water equal to one hundred tons per acre, it follows that the deficiency of rain during last year was equal to about 730 tons per acre. The sun was above the horizon during 242.7 hours during December, but only 13.3 hours of bright sunshine were recorded at Greenwich; this amount was considerably below the average, though it slightly exceeded that registered in the corresponding period of 1883. South-westerly winds prevailed during the first three weeks of the month, after which the wind was easterly until the end of the year.

In the twenty-eight large English towns dealt with by the Registrar-General in his weekly return, which have an estimated population of more than eight millions and three-quarters, 28,334 births and 19,115 deaths were registered during the five weeks ending the 3rd inst. The annual birth-rate, which in the two preceding months had been 34.9 and 33.8 per 1,000, further declined to 33.7 during December, but exceeded the rate recorded in the corresponding month of the preceding year. The lowest birth-rates in these twenty-eight towns last month were 28.3 in Huddersfield, 28.5 in Brighton, and 29.4 in Bristol; in the other towns the rates ranged upwards to 38.9 in Preston, 40.1 in Sunderland, and 41.5 in Cardiff. In London the birth-rate last month was equal to 33.1 per 1,000, while in the twenty-seven provincial towns it averaged 34.3.

The annual death-rate in the twenty-eight towns which had been 20.5 and 21.7 per 1,000 in the two preceding months, further rose to 22.8 during December, and exceeded by 0.9 per 1,000 that recorded in the corresponding period of 1883, which was 21.9 per 1,000. The lowest annual rate of mortality last month in these towns was 18.7 in Portsmouth. The rates in the other towns, ranged in order from the lowest, were as follow:—Huddersfield, 20.1; Plymouth, 20.5; Birkenhead, 20.6; Sheffield, 21.1; Brighton, 21.2; Wolverhampton, 21.4; London, 21.7; Leeds, 21.7; Bristol, 21.9; Birmingham, 22.0; Bradford, 22.4; Derby, 22.4; Nottingham, 22.5; Salford, 23.0; Bolton, 24.4; Hull, 24.5; Newcastle-upon-Tyne, 24.5; Sunderland, 25.3; Oldham, 25.3; Liverpool, 25.5; Halifax, 25.6; Leicester, 25.9; Manchester, 26.5; Norwich, 26.7; Blackburn, 26.8; Cardiff, 30.3; and the highest rate during the month, 32.3 in Preston. While the death-rate in London during December, as above stated, did not exceed 21.7 per 1,000, it averaged 21.7 in the twenty-seven provincial towns. The 19,115 deaths from all causes in the twenty-eight towns during the five weeks of December included 1,869 which were referred to the principal zymotic diseases, of which 406 resulted from measles, 399 from whooping-cough, 318 from scarlet fever, 226 from 'fever' (principally enteric), 187 from small-pox, 182 from diphtheria, and 151 from diarrhoea. These 1,869 deaths were equal to 9.8 per cent. of the

s, and to an annual rate of 2.23 per 1,000. The death-rate showed a further slight decline from recent months, and was below that recorded in the corresponding period of either of the two preceding years when it was 2.82 and 2.71 per 1,000 respectively. The rate in London from the principal zymotic diseases equal to 2.1 per 1,000 during December, and below the average rate in the twenty-seven towns, among which the zymotic death-rate was 0.7 and 0.8 in Huddersfield and Portsmouth, 3.6 in Bristol, 4.2 in Preston, 4.2 in Leicester, and 4.1 in Liverpool.

Small-pox was the most fatal zymotic disease in the twenty-eight towns during December last. The rate of fatality from this disease, which in the two preceding months had been 0.27 and 0.42 per 1,000, further rose to 0.48; in London the death-rate from this disease was 0.33 per 1,000, whereas in the twenty-seven towns it averaged 0.62, and showed the highest fatality in Bristol, Leicester, and Cardiff. The death-rate from whooping-cough, which had been 0.37 per 1,000 in the two preceding months, rose during December to 0.48, which differed but little from the rates in recent corresponding periods. Small-pox continues to be considerably more fatal in the twenty-eight towns than in London, and was most prevalent in Bristol, Norwich, and Preston. The rate of fatality from scarlet fever, which in the two preceding months had been 0.38 to 0.45 per 1,000, declined again to 0.38, and was considerably below that recorded in the corresponding month of either of the two preceding years. In London the scarlet fever death-rate was 0.30 per 1,000, while in the twenty-seven towns it averaged 0.45, and was proportionately most prevalent in Halifax, Newcastle-upon-Tyne, and Sunderland. The mortality from 'fever' (enteric or typhoid), which had been 0.41 and 0.50 in the two preceding months, further fell to 0.27; this disease showed the largest fatality in Norwich and Cardiff. The death-rate from this disease showed a slight increase upon that recorded in the two preceding months; this disease was proportionately three times as fatal in London as in the aggregate of the provincial towns. During the five weeks of December 187 deaths from small-pox were registered in the twenty-eight towns, showing a considerable further increase in the numbers in the three preceding months. Small-pox, however, was confined to London, for while 187 cases of this disease registered in the metropolis during December, the twenty-seven provincial towns have shown only 18.

Of the 187 deaths from small-pox during December were registered in London, 3 in Liverpool, 1 in Brighton, and 1 in Cardiff. Judged from the returns of the Metropolitan Asylum Hospitals, the number of small-pox in London continued to increase during December. The number of small-pox patients admitted in these hospitals, which had been 536 and 540 in the two preceding months, further rose to 573 at the end of December. The average weekly number of new patients admitted to these hospitals, which was 73, 84, and 203 in the three preceding months, rose to 217 during December.

The rate of infant mortality in the twenty-eight towns, during the proportion of deaths under one year of age, was equal to 151 per 1,000 during December, against 165 and 159 in the corresponding months of the two preceding years, 1882 and 1883. The rate of infant mortality was equal to 136 in London, whereas in the twenty-seven provincial towns it ranged from 110 and 127 in Brighton and Oldham, 213 in Halifax, 223 in Liverpool, and 249 in Norwich.

The death-rate from diseases of the respiratory organs, during the month of December, was considerably above the average during December. The weekly number

of deaths referred to these diseases in London averaged 470, and the annual death-rate was equal to 5.9 per 1,000. In Liverpool the annual rate of mortality from these diseases was last month equal to 7.3 per 1,000.

The causes of 505 of the 19,115 deaths registered in the twenty-eight towns during the five weeks of December were not certified, either by a registered medical practitioner or by a coroner. These uncertified deaths were equal to an annual rate of 2.6 per cent. of the total deaths, which showed a slight further increase upon the proportions in recent months. In London the proportion of uncertified deaths was only 1.4 per cent., while in the twenty-seven provincial towns it averaged 3.6, and ranged from 0.0 and 0.7 in Derby and Plymouth, to 6.2 in Liverpool, 7.4 in Oldham, and 8.2 in Hull.

Among the population living in the outer ring of suburban districts around London, estimated at rather more than 1,000,000 persons, the annual death-rate from all causes during December was equal to 19.9 per 1,000, against 20.9 and 17.9 in the corresponding periods of 1882 and 1883. During the five weeks ending the 3rd inst. 104 fatal cases of small-pox, 33 of measles, 29 of diphtheria, 29 of whooping-cough, 25 of 'fever,' 17 of scarlet fever, and 10 of diarrhoea were recorded in the outer ring. These 247 deaths were equal to an annual rate of 2.4 per 1,000, which exceeded that recorded in the corresponding month of either of the two preceding years. The fatality of small-pox, measles, 'fever,' and whooping-cough showed an increase, while that of scarlet fever and diphtheria declined. Of the 104 deaths from small-pox recorded in the outer ring during December, 85 occurred in West Ham district (including 16 of London residents registered in the Metropolitan Asylum Hospital at Plaistow), 5 in Tottenham, 7 in Croydon, and 3 in Barking Town. Of the 25 fatal cases of 'fever,' 7 occurred in Tottenham sub-district, and 9 deaths were referred to measles in the sub-district of Mitcham.

NOTIFICATION OF INFECTIOUS DISEASES.

IN a table on page 330 are published uniform statistics relating to sickness and mortality in thirty-two of the thirty-nine urban sanitary districts of England and Scotland in which the notification of infectious diseases is compulsory. The estimated population of the thirty-two districts for which we are enabled to publish complete statistics for the month of December last is more than two-and-a-half millions of persons. The annual rate of mortality from all causes per 1,000 persons estimated to be living in these towns, which in the two preceding months had been 20.51 and 21.91 respectively, further rose during December to 24.00. In the twenty-eight large English towns dealt with by the Registrar-General in his weekly returns, the death-rate during December last averaged 22.80 per 1,000, and was, therefore, 1.20 below the mean rate in the thirty-two towns in the accompanying table. The rates of mortality last month were considerably below the average in Barrow-in-Furness, Heywood, Reading, Accrington, and Birkenhead; while they showed an excess in Dundee, Burnley, Preston, and Stalybridge. The death-rate from the eight infectious diseases dealt with in the table averaged 0.71 per 1,000 in the thirty-two towns furnishing this information, showing a further decline from the rates recorded in the two preceding months, which had been 0.98 and 0.91 per 1,000 respectively. No death from any of these diseases was returned in Accrington, Hartlepool, Lancaster, or Macclesfield, and only a single fatal case in Leek, Heywood, and Warrington, while they caused the highest rates of mortality in Burton-upon-Trent, Bury, Halifax, Preston, Salford, and Stalybridge. Small-pox caused 1 death in Birkenhead; scarlet fever was proportionally most fatal in Halifax, Preston, and Rotherham; diphtheria in Burton-upon-Trent and Salford; and enteric fever in Halifax, Aberdeen, and Bury.

Two deaths from puerperal fever were returned in Greenock, 1 in Huddersfield, and 2 in Salford. Typhus caused 4 deaths in Edinburgh, and 2 in Salford. With reference to the notified cases of infectious diseases in the thirty-two towns, it appears that the proportion of the population reported to be suffering from one or other of the eight diseases was 5.24 per 1,000, against 7.92 and 6.71 in the two previous months. The proportion did not exceed 0.53 per 1,000 in Warrington, 1.08 in Jarow, 1.39 in Accrington, and 1.73 in Huddersfield; in the other towns it ranged upwards to 8.13 in Halifax, 1.28 in Stalybridge, 8.95 in Barrow-in-Furness, 9.07 in Edinburgh, and 9.92 in Derby. The high rates recorded in the last-mentioned towns were caused by the excessive prevalence of scarlet fever. Twenty-two cases of small-pox were notified in Birkenhead during December, against 32 and 30 in the two preceding months; scarlet fever was proportionally most prevalent in Barrow-in-Furness, Derby, Halifax, Leek, and Rotherham; enteric fever in Salford, Bury, Derby, and Aberdeen; and diphtheria in Dundee, Edinburgh, and Greenock.

SPECIAL REPORTS.

REPORT ON OVER-PRESSURE OF THE SUB-COMMITTEE OF REPRESENTATIVE MANAGERS OF LONDON BOARD SCHOOLS.

THE sub-committee appointed to consider the question of 'Over-Pressure' (consisting of Messrs. Sydney Buxton, F.P., R. S. Doll, J. Faulkner, F. Fermor, Albert Rutson, Miss Gladstone, Miss Hickson, Revs. A. W. Jepson, J. H. Rose, R. O. Thorpe, R. J. Simpson, Lady Stevenson, and Major Wade) have obtained much information on the subject, and have carefully considered the question submitted to them. 1. They are convinced that the children are, as a whole, not only educationally, but physically, much the better for attending school. 2. At the same time, there is evidence that under certain conditions (on the one hand, where the child is underfed, suffers from bad health, defective intellect, longstanding neglect or irregularity; and on the other hand, where the child is over-excitable, too eager or anxious) some overstrain does occasionally occur. But the cases of over-pressure are proportionally not numerous, nor is the evil widespread. 3. They believe that much has been done, and more will in the future be done by the New Code to prevent over-pressure. 4. But they think that the New Code cannot produce the results intended, unless it is administered in spirit as well as in letter; and they do not think that this is always the case at present. 5. With this preface, the sub-committee beg leave to make the following recommendations:—

(i.) *Home Lessons*.—As a general rule they do not think home lessons desirable; and they recommend that their imposition should be left to the discretion of the managers and teachers jointly. The sub-committee are of opinion, moreover, that home lessons should be absolutely prohibited for children below the third standard, and altogether in schools of 'special difficulty.' (ii.) *Keeping in for Lessons in cases of backward children*.—They endorse the recent circular of the Board on this subject, which absolutely prohibits 'keeping in' except for punishment. (iii.) *Board Inspection*.—They strongly recommend that the Board's inspectors should be more of inspectors' and less of 'examiners.'

They also recommend that, except under special circumstances, the reassessment of H.M.'s inspectors' reports by the School Management Committee should be discontinued. (iv.) *Returns, &c.*.—They recommend that all returns, accounts, correspondence, &c., falling on the teachers, should be, as far as possible, minimised. (v.) *Power of withholding children from examination, and*

from preparation for examination.—By the Code, the managers have power to withhold children from examination, if they can satisfy H.M.'s inspector of the reasonableness of the ground for withdrawing them. Such withdrawals do not in any way affect the grant. Managers can also, for reasonable cause, present a child a second time in the same standard. The sub-committee find that these provisions of the Code are not generally understood. They recommend, therefore, that managers should be specifically instructed that they have the power, and ought to undertake the duty, of withdrawing from examination such children as are likely to suffer from the examination itself, or from the preparation for it; and that it should be pointed out to them that they cannot perform this duty unless these children are watched throughout the year. The withdrawal should be consequent on the managers' own observations and the recommendation of the teachers. (vi.) *Managers*.—The appointment of competent managers in sufficient numbers is a matter of the greatest importance, and the sub-committee recommend it as demanding the serious attention of the Board. It is impossible without the frequent visits of competent managers, co-operating with the teachers, that the discrimination required by the Code between those children who are fit and those unfit to be prepared for examination should be properly made; and it is obvious that in many other matters in the course of their school life, some of them bearing on over-pressure, children may be materially helped and befriended by the managers. (vii.) *Underfeeding and Irregularity*.—Though both these matters largely conduce to such over-pressure as exists, the sub-committee make no recommendation in regard to them. The first subject is now being considered by a council appointed for the purpose; the second is one largely depending on the administration of the compulsory powers of the Board, and on the personal influence of the teachers.

Signed:—ALBERT RUTSON (*chairman Sub-Committee*), SYDNEY BUXTON (*chairman Committee of Representative Managers*), R. S. E. DOLL, J. FAULKNER, F. FERMOR, F. M. GLADSTONE, E. H. HICKSON, A. W. JEPSON, T. H. ROSE, R. T. SIMPSON, C. STEVENSON, R. O. THORPE, J. M. WADE.

December 1884.

SANITARY MATTERS IN AMERICA.

[FROM OUR OWN CORRESPONDENT.]

THE state legislature of New York, at its session last winter, provided for the appointment of a tenement-house commission, which should make an exhaustive investigation into the tenement-house question in the city of New York. The commission was liberally provided with money, and it was sincerely hoped by all sanitarians who recognised the extent of the danger from this cause, that the commission would find a remedy to propose to the legislature, which should ameliorate the condition of the people living in tenements, and abate the nuisances caused by the herding together of so many people. The commission, through its inspectors, began work last summer on a very extensive plan. One of their schedules of inquiry lies before me as I write. It contains 519 blank spaces in which to write information desired. The commissioners held a meeting recently, and it was reported that they began to realise that the amount of work demanded of the inspectors was so great that they could not hope to cover all the desirable territory in time to formulate their report which, by the organic law, they are compelled to make to the legislature during this winter's session. The trouble, it is thought, lies in the fact that the Commission tried to accomplish too much. One of the leading members of the Commission, Professor Felix Adler, delivered a lecture on the tenement-house question in New York, before a very wealthy and distinguished audience, gathered in Chickering Hall, in that city, on Sunday, Nov. 30.

From his standpoint the greatest evil to be feared is that which results from overcrowding, and he related the case of a man who, with his wife, children, and nine boarders, lived in two small rooms. He reproved the Health Department of New York, indirectly, when he stated that the law providing an allowance of 600 cubic feet of air for each person was constantly being violated. He recommended that steps should be taken to raise such a sum as was done in London, viz., 12,000,000 dols., for the purpose of erecting dwellings for 50,000 persons on 42 acres of land. He also urged that the public baths should be kept open continuously, instead of closing them during the winter months. The report of this Commission, and the recommendations it makes, will be awaited with much interest.

There have been some very sensational stories vigorously presented through our daily press, concerning the terrible ravages of an epidemic disease among the people inhabiting that mountainous region lying in Western Virginia and Eastern Kentucky. Members of the State boards of health of West Virginia and of Kentucky have been despatched to the scene, and, while their reports have not yet been made public, it is believed that the disease, which has been credited with the deaths of hundreds of persons, and is said to have resembled cholera, will prove to be nothing but an aggravated epidemic of dysentery, caused by contaminated water taken from wells with a very low stage of water, owing to a protracted drought.

From various parts of the States come reports of epidemics of contagious diseases, as diphtheria at Chicago, and measles at Cleveland, Ohio, where there have been 800 cases and 270 deaths since June last.

But the most alarming epidemic exists in the province of Ontario. Small-pox in a very malignant form is raging at two localities about 100 miles from Toronto. Dr. Bryce, the Secretary of the Provincial Board of Health, who has just returned from a visit to the township, writes that there have been over 100 cases there, with a large death-rate. In one place eight persons were found sick in one room. In the village of Stoco the disease had invaded nearly every house. The Board is doing its best to confine the spread of the disease.

There comes from Columbus, Ohio, this month, a tale of the worst derangement of ventilation and sewerage which could possibly exist. It is in no less pretentious a building than the State-house of Ohio. Two deaths from typhoid fever have occurred from among the clerks engaged in the office most affected, while the head of the department has just recovered from a severe attack of the disease. These are not the only cases, for some of the officers have lately been on the sick list nearly the whole time. The credit for determining the cause of the sickness must be accorded to a correspondent of the *Cincinnati Engineer*, who made a searching investigation, and has just published its results. The systems of heating, ventilation, and sewerage were originally satisfactory. Seven years ago the State treasurer desired a water-closet put in his own apartments, which was done. The soil-pipe, however, instead of being carried to the common soil-pipe of the building, was conducted into one of the brick fresh-air flues. Last winter a ladies' toilet room, the waste-pipe from which was properly connected with the soil-pipe, was changed into a water-closet, the proper connection destroyed, and a new soil-pipe carried directly into the main brick air-chamber. There was no escape for the sewage from these chambers, unless it evaporated into the fresh air supplied the employes of the State. It is a good sanitary lesson to the legislature which may now be induced to pass a law creating a State Board of Health.

The past few months have been peculiarly unfortunate in that so many prominent sanitarians have died. Thirteen members of the American Public Health Association died last year, a death-rate of about twenty-six in a thousand. Four secretaries of State Boards of Health have died: Harris, of New York; Chamberlain, of Connecticut; Farquharson, of Iowa; and Hatch, of California. Lastly

comes the news of the death of Dr. Samuel M. Bemiss, of New Orleans, a prominent sanitarian and member of the National Board of Health.

The National Board of Health hopes to receive recognition and an appropriation from the Congress just assembled. The President of the United States, in his annual message to Congress, recommended that laws be enacted requiring that all rags be disinfected before being allowed to be entered into our ports. Otherwise, he failed to speak of the health of our people and the danger from cholera. However, the President's recommendation amounts to but little with our Congress, and we shall probably receive no sanitary legislation. The National Board of Health now existing without financial support, hopes to secure control of the fund which may be set apart to combat cholera should it come to our shores. It is probable, however, that the control will be given to the surgeon-general of the marine hospital service.

The Conference of State Boards of Health, which met in Washington, December 10 and 11, transacted a good deal of business, and listened to several reports relating to the sanitary condition of various states and cities. The chief work of the session was the adoption of the report of the Committee on Federal Legislation, which consisted of a draft of a Bill for a new National Board of Health. As finally adopted and presented to the Public Health Committees of the Senate and House of Representatives, the Bill provides that a National Board of Health shall be established, to consist of one member from each State Board of Health now established, or which may hereafter be established in the United States, to be appointed by the President and confirmed by the Senate, and whose compensation, when actually engaged in the performance of duty, shall be 10 dollars a day and reasonable expenses. The Board will meet annually in Washington, and, in cases of emergency, upon the call of its chairman and secretary, or upon the extraordinary call of the President of the United States. The duties of the Board shall be to make investigations at any place in the United States or at any foreign port or place, and to collect information upon all matters relating to the public health, and to frame necessary rules and regulations for the government of the quarantine service, the rules and regulations of the Board to be carried out by such departments of the Government as the President shall direct. The Board shall co-operate with and aid State and Local Boards of Health in the enforcement of their rules and regulations in preventing the introduction of contagious diseases. The Board shall also make rules and regulations to be observed by vessels at ports of departure, where such vessels sail for the United States. The penalty for any vessel which enters the ports of this country contrary to the regulations established by the Board is 1,000 dollars. The Board is to maintain a weekly exchange of reports of sanitary conditions of domestic and foreign places. There is mentioned the sum of 500,000 dollars, as being the proper amount to appropriate in order to carry out the provisions of this law.

The Conference, after adopting the Bill, of which the above is a brief abstract, adjourned for one year. It now remains to be seen whether Congress will pass the Bill. If so, it will be a satisfactory solution to the vexed question as to which department of the Government shall have charge of our health administration.

As an illustration of the difference in the average death-rate of the several districts of one town, it may be noted that during the fortnight ending January 6 the number of deaths in the South Ward of the borough of Gateshead exhibited a ratio of 12.95 per 1,000 per annum, whilst during the same period the West Ward of the same town showed a ratio of 37.16 in the 1,000 per annum; the other wards of the town also showed a marked difference in their average death-rate. There is no serious epidemic, and the excessive mortality arises principally from the frightful infant mortality which seems indigenous to certain localities.

NEW INVENTIONS.

PATENT SMOKE CONSUMING AND VENTILATING GRATE.

Outcome of an appliance shown in a very vainly as an attachment to existing grates) at the International Exhibition, South Kensington, in 1873, although at that time in a very imperfect formance in the testing-house was so satisfactory a prize medal was awarded it. Since that time, Messrs. Reeve and Ratcliffe, Little and Co., have made several improvements on the grate, and a sectional and elevated drawing of the complete grate, is appended, although the claim that they can alter existing grates is as to cost, &c., to their system. The

the residuum entering a small flue at either side, when they are carried upwards, and eventually meet in the chimney proper, which comprises the syphonic action before alluded to. The effect of the ventilator under the fire-basket is to draw in fresh air, a portion of which, after passing through the heated passages it has to traverse, is emitted into the apartment, and the other portion is carried up the side flues, this action tending, in combination with the other effects, to promote combustion. The advantages of this grate are considerably enhanced by the length of time the fire is in force. The effects of many good grates are considerably reduced by the short time they are in daily use. The system of allowing fires to go out at night too often interferes with the best points in their construction, and in one like the 'Cosy,' the advantages of banking up at night, which may be done with perfect safety, would soon be realised. In the asbestos lumps in the filter we have an indestructible fuel that



drawn out in this grate is that of filtration of the products of combustion before they enter the apartment—a somewhat novel but admirable idea—and the withdrawal of the vitiated air of the apartment by the mild or almost draughtless syphonic action, instead of the great rush of draught or cold air from an ordinary or direct action open grate. The action of the heat that usually passes up the chimney is arrested and utilised as it should be for domestic purposes, economising fuel at the same time, the appliances being decidedly conducive to the comfort of the room. As shown by the engraving, the sides of the fire-basket are of fire-clay, and underneath communicating with the chimney. A range of louvres at the back of the grate carry the products of combustion into this chamber, which communicates with the chimney by means of a valve, which, when opened, assumes a position, and is actuated by a knob in front of the grate, and is, however, only opened when the grate is lighted, after which it is closed, and the products of combustion reach this chamber and finding their way down the chimney closed, are drawn downwards by the syphonic action, the chamber composed of small asbestos lumps, which absorb their unburnt particles,

quickly becomes red hot, and remains incandescent so long as a fire of ordinary proportions is kept in the grate, and one that only loses its heat when the fire is allowed to go out altogether. It must be palpable, then, that the more the heat is retained in the asbestos filter the better will be the effects obtained from this grate. The fire is lighted with little trouble, is of the most genial character, easily kept up, and remarkably free from smoke, while considerable heat is diffused throughout the apartment. Owing to the syphon action obtained by means of the side flues, the thorough-exhaust ventilation of the room can be effected by the addition of a tube at the sides of the chimney-breasts communicating with them.

Wherever the 'Cosy' grate has been fixed it has met with the most unqualified praise. It can be made in any kind of design, and, should a large demand arise, at what may be termed popular prices.

HOME GYMNASIA.

AN illustration of the capability of combining in one simple apparatus, arrangements for exercising every muscle in the body, such as hitherto has only been attained by the use of a variety of appliances, is shown in the new 'Excelsior' Health Exercising Apparatus recently intro-

duced into England by the Chadborn & Coldwell Manufacturing Company, 223 Upper Thames Street, London. It will be universally conceded that a portable gymnasium, capable of being used in a house of the most moderate dimensions, suitable alike for the child, the adult, and even those in declining years, at a cost within the means of persons with limited incomes, is a very useful hygienic invention.

The apparatus in question is made in three sizes, each of which is sufficiently large for the use of an adult; the smallest occupying a ground space of only 2 ft. square and the largest 4 ft. by 2 ft. and 7 ft. 6 in. high; yet in this limited area over one hundred different combinations or exercises are provided for. Here the athlete can keep himself in constant practice by exercising on the horizontal or parallel bars, the trapeze, or, if he be a rower, take his position as in a boat, and, with either sliding or fixed seat, go through a course of exercise so apparently real as scarcely to differ in its minutest effect from the actual pastime. The child can enjoy the pleasure of a secure swing, the tilting board, or 'see-saw,' and juvenile trapeze; and besides these, there are innumerable exercises for promoting the cure of certain surgical diseases, effected by a mere change of position, and readjustment of the ropes

Rowing Reverse Movement.—Expands the Chest and Strengthens the Legs and Arms.



FIG. 1. Rowing—Start and Finish. To develop the Arms, Legs, and Back.



FIG. 2. Direct Chest Movements. To deepen the chest and draw the shoulders back.



FIG. 3. Curved Board—To Strengthen the Back, Neck, Abdominal Muscles, and Expand the Chest.



FIG. 4. For Curvature of the Spine.

and weights. Four small illustrations of a few of the exercises are appended. Further examples of this Home Gymnasium of an unique character will be given in future numbers of the SANITARY RECORD.

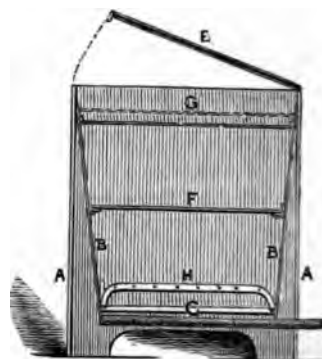
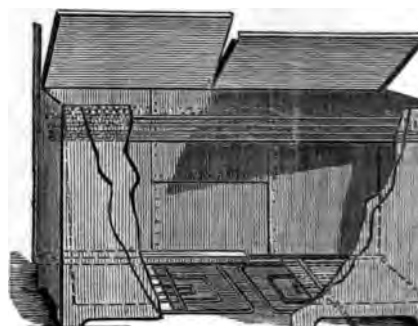
Each of the exercises is clearly set forth with illustrations on a chart, enabling any one to perform them without further tuition. In the rowing illustration the operator is seated on a fixed or sliding seat. In his hands he grasps two handles attached to ropes passing through pulleys over the top of the machine, and connected with weights (dumb bells), regulated according to the power of the user, and which slide up and down a pair of tramway frames. In fact, this system of weights is the main feature running through all the exercises. The curved board is an excellent and pleasant mode of performing the exercise mentioned at the foot of the illustration, and the exercise for curvature of the spine (the movements being shown by dotted lines) is only one

of many provided by the machine for this disease. The apparatus is constructed from maple, hickory, or wood, securely bolted together, yet capable of being taken to pieces in a few minutes. A variety of small apparatus for carrying out some of the exercises are sent with the main apparatus, and has already attracted considerable attention among the medical profession, gymnasts, and private individuals. A very flattering testimonial to its merits has been received from the Instructor-General of Gymnastics in the Army at Aldershot, who anticipates a marked physical development of recruits by its use.

IMPROVED DISINFECTING APPARATUS

AN apparatus for the disinfection of wearing apparel, bedding, and other materials has lately been patented and put to practical use by Mr. Thomas Jennings, of Lambeth, S.E., and this apparatus bids fair to cause quite a revolution in respect of contrivances prepared for the destruction of *contagia viva*.

The heat is produced by gas-jets placed at the bottom of the apparatus, and the dispersed heat passes through the openings, producing in the interior of the apparatus a newly-formed current of heated, but less, unburnt air. In order to prevent the production of smoke, atmospheric burners are made use of instead of ordinary ones. We give a view of the interior of the apparatus. It is composed of an outer box, A, which is at present of iron, covered with asbestos or some other suitable non-conductor, and in this is an inner box, B, of less depth and somewhat taller at the bottom, is fixed. The top of this inner box is hinged to the top of the outer box, and a number of flaps



formed through the upper part of the side of the inner box as shown at G. The burners for the ignition of a mixture of gas and air are placed at C, below the bottom of the inner box. By taking advantage of the natural law of circulation of heated air, a complete circulation is

l throughout the whole of the interior of the inner and a uniform and penetrating, but moist heat is consequently generated.

e outlet from the inner box is provided with a valve i can be regulated at pleasure.

e lid by which the box is closed at the top is shown and this can be worked either by balance-weights, or chet-wheels, which are easier to actuate.

e box can also be made with the front or the ends to

conclude this short description of the apparatus, we point out that the means of upholding the articles d in the interior of the box are by rods placed across inner box at F. A similar grating is placed just above otom of the inner box at H to receive other materials ing disinfection. As a matter of course, so long as rinciple is preserved, so that no moisture or conden- be gathered from the atmosphere, and an uniform rating heat insured in the interior, the apparatus can nstructed of such a size as readily to take in whole esses, chairs, or sofas; the only difference being that esses would take longer to disinfect on account of thickness. For furs, and such like articles, an uniform an be held in suspension by a very little proper regu-

e value of this new disinfecting apparatus, which justly ed both a silver and bronze medal at the late Interna-

Health Exhibition, 1884, was sufficiently made mani- t a lengthy and crucial series of experiments conducted r. Bartlett and other gentlemen some months ago. In more than half an hour the temperature rose to 262° , and afterwards, for the space of 41 minutes, this le and nearly unvarying temperature was main- d at a total expenditure of 100 feet of gas. The rs tested were cambric, muslin, calico, flannel, a cushion, bakers' yeast, and certain germinal matters. e latter were obtained from the air of an hospital, and ed pus cells, bacteria, nomads, entozoa, and fungi.

ed result proved that, even at the high heat main- d, such was the uniform disposition of the heat and emoval of vapour that the fabrics placed even near otom of the box, were taken out perfectly uninjured without loss of colour or textile strength. The yeast completely sterilised, and produced no fermenting n upon sugar solutions, &c., and the germinal and id growths were all killed, and could not be revived r by moisture or by treatment with Pasteur's solution. mites, the vibrios from decomposed meat, and the n parasites were also destroyed. Other experiments shown that linen, flannel, &c., have been subjected 0° Fahr., and muslin to 300°, without sustaining the est damage. Bedding and mattresses are not only id, but improved, inasmuch as the heat causes the g-in material to expand, and thus saves the trouble of king them. It can easily be understood also that a d lot of materials can be purified in a less time with a nished consumption of gas. Moreover, the apparatus, b can be made to run on wheels, is well adapted, not for disinfecting purposes, but for drying and airing.

apparatus, 7 feet 4 inches long, 3 feet 4 inches wide, 3 feet 4 inches deep, outside measurement, has pro- d 280° of heat in 25 minutes, with a consumption of et of gas. Three hundred and fifty degrees can be ned in 55 minutes, at an expense of 150 feet of gas, his is more than what is necessary to destroy harmful s. Practically, thorough disinfection of fabrics and destruction of hurtful germs and vermin can be ved in this apparatus in one hour at a temperature of 240° to 260° Fahr., with an expenditure of a little 100 cubic feet of gas, which at ordinary rates would ess than 4d.

simplicity, cheapness of working, and rapid action d recommend this disinfecting apparatus to the autho- of hospitals, infirmaries, sanatoriums, schools, public tions, and mansions, as being alike suitable for dis- ion, perfect drying, and airing of all kinds of material.

THE 'SILENT' SYSTEM OF VENTILATION FOR PRISONS.

THE ventilation of prisons has always been a matter of peculiar difficulty, as, owing to the necessity of having the cells thoroughly isolated from each other, any system that did not effect that object and at the same time secure a continuous change of air in each cell was practically useless. As there was really no system in existence whereby a number of cells could be ventilated into one shaft, and at the same time sound prevented from passing from one cell into another, Messrs. Robert Boyle & Son, the well-known ventilating engineers, have, after giving the matter the most careful consideration, devised an arrangement which is most ingenious and yet exceedingly simple, and there can be very little doubt but that it will effectually answer the purpose for which it is intended. The system may be described as follows:—Take a block or wing of a prison, consisting of, say, three tiers of cells on each side, composed of thirty cells on each tier or row, making 180 in all. Three brick flues, internal measurement 2 ft. x 2 ft., are built at equal distances against each of the side-walls, and carried up above the roof, where they are surmounted with the Self-acting Air-pump Ventilators, of 3 ft. diameter. Three horizontal shafts run along each tier immediately underneath the ceiling and close to the wall. Each of these shafts is connected with ten cells by means of protected openings, varying in size in proportion to the distance of the opening from the upcast shaft, so as to equalise the quantity of air extracted from each cell. Three of these horizontal shafts, one on each tier, are connected with one of the upcast shafts, which forms a junction in the centre. The horizontal shafts vary in size according to their proximity to the top of the upcast shaft, so as to equalise the quantity of air drawn from each tier. A ring of gas-jets is fixed at the bottom of the upcast shafts for the purpose of warming them in cold weather and preventing condensation of the ascending column of foul air. The peculiar feature in this arrangement is that the ventilating opening in one cell is isolated from the openings in the other cells by means of a metal plate or partition extending from it along the shaft and past the opening of the second cell to it; and so on with all the other cells, they being treated in a similar manner, one partition plate overlapping the other the length of two cells from the one it is connected with until the central upcast shaft is reached, where a divisional plate is fixed in the horizontal shaft to prevent the two currents (travelling in opposite directions) from striking each other and creating a swirl as they enter the upcast shaft. Each partition plate is deafened round the opening into the cell by means of a double plate packed with sand. The horizontal shafts as they pass through the cells are also protected and deafened by means of a double casing, having the space between packed with sand.

The advantage of this system is that every cell is equally and separately ventilated, whilst perfect isolation is secured, it being impossible for sounds to pass from one cell into another through the ventilating shafts or openings, whilst as many as from ten to twenty cells can be ventilated by the one pipe, and three or four of these lead into one upcast shaft. An important feature is that there are no valves used in connection with any part of the system; so that when once fixed no further attention is required, and the ventilation cannot be interrupted through negligence, as is usually the case where ventilating arrangements are employed that require looking after. Messrs. Boyle have entitled this arrangement the 'Silent' System of Ventilation for Prisons, a very appropriate name.

Fresh warmed air is introduced into each cell through vertical channels cut in the walls protected outside and inside with strong iron gratings. These channels open into the galleries on the inside of the building, and are supplied with air from two large openings at each end of

the block, through which the fresh air passes over a heating arrangement in cold weather, and is thoroughly warmed before entering the cells through which it must pass before finding an exit.

We understand that Messrs. Boyle are taking steps to have the system practically tried at one of our large prisons.

CORRESPONDENCE.

Audi alteram partem.

[All communications must bear the signature of the writer, not necessarily for publication.]

AWARDS FOR VENTILATORS AT THE LATE HEALTH EXHIBITION.

In reply to Mr. Clark's letter *re* the above, which appeared in your last issue, we have only to repeat that we were *not* invited to send our air-pump ventilator, which is the only exhaust ventilator we either manufacture or sell, for the purpose of being tested, nor were we notified that tests were being made with exhaust ventilators; we, as already stated, not being even aware that such tests were instituted until after they were completed and the awards made. Under these circumstances, it seems rather superfluous for Mr. Clark to say that we were *not* excluded from the testing, seeing that we—why, we cannot understand, though we mean to find out—were left in entire ignorance of the existence of such tests. Mr. Clark states that we were invited in *proper* form to send our ventilator to be tested, and also that he holds a letter from us declining to comply with his request. As this is really a matter of not only private but public interest, we now call upon Mr. Clark to publish the letter referred to, so that your readers may be enabled to judge between us, and that we may have the opportunity of showing how we have been treated.

With respect to our error in the length of the testing tube, stating that it was eight feet, whereas Mr. Clark informs us that it was ten feet long, this additional length, instead of improving the position, shows all the more conclusively that the mode of testing was a *farce*, and we are prepared to argue this point with Mr. Clark either as a question of science or practice, or as both, and to prove the correctness of our assertions, which we make as practical men of extended experience.

From the accounts we have since read of the experiments and the manner in which they were conducted, we much fear that they will have the effect of bringing sanitary science into discredit with the public, and do it almost as great an injury as the notorious 'Kew Experiments,' which is greatly to be regretted, as it retards and hampers the efforts which earnest and practical men are now making to popularise the cause amongst the people.

We derived the information from a credible source that the shafts of the ventilators tested were inside the tube, but, as Mr. Clark affirms, and we have no knowledge of ourselves to the contrary, that such was not the case, we will concede the point, which does not affect materially the method of testing the ventilators.

As we in the whole course of our experience as ventilating engineers have never heard mention of Mr. Clark as an authority on ventilation, it might, as indicating the value to be attached to that gentleman's labours, be satisfactory to your readers, as it certainly would be to us, to be informed of his qualifications to decide a question relating to ventilation in such an off-hand manner, which has hitherto baffled the most scientific and practical experts on the subject, viz., the determining by *scientific experiment* the relative values of ventilating cowls.

Mr. Clark stigmatises part of our letter as 'abusive.' If stating that we will not allow this matter to drop until we have sifted it to the bottom and discovered the individual or individuals really to blame is 'abuse,' then we

admit the impeachment; or, if our remark that the experiments in question are a reflection on the intelligence of the nineteenth century be considered 'abuse,' then we again admit the impeachment.

As we presume we may look upon Mr. Clark's letter as a final reply, so far as the jury are concerned, to our letter of protest addressed to Sir Philip Cunliffe-Owen in his capacity of official representative of the jury, and receipt of which that gentleman duly acknowledged, we herewith beg to append that letter as showing how the matter stands.

Queen Anne's Buildings,
64 Holborn Viaduct, London, E.C.,

Nov. 4, 1884.

To Sir Philip Cunliffe-Owen, Secretary to the late Health Exhibition, South Kensington.

Dear Sir,—We are informed, and for the first time, that the exhaust ventilators exhibited at the late Health Exhibition, South Kensington, have been submitted by the jury to a series of tests, with the view of ascertaining which was the best and entitled to the first prize. As we received no notification that such tests were going to be made, nor were we invited to submit our self-acting air-pump ventilator, exhibited at the Health Exhibition, for the purpose of being tested along with the others, we beg to ask you, as the representative of the jury, for an explanation of the omission, and the reason for our ventilator being excluded.

We have also to ask you if it is correct that Mr. J. P. Seddon, architect, formed one of the jury on ventilation, and that five medals have been awarded to the ventilating and sanitary appliances of a firm which that gentleman has been the public advocate of for these last seven years, he being also well known to be strongly antagonistic to us personally and to our ventilating arrangements?

During the time of the Exhibition we repeatedly attempted to ascertain the names of the jury; but, for reasons best known to that body, none of their names were allowed to be divulged—an unprecedented proceeding, and entirely contrary to the recognised rules which control all Exhibition juries. We beg to remark, however, that in England men do not submit to be condemned by secret tribunals without even having been brought to trial, as is the case with us in the present instance.

Enclosing a pamphlet containing the notorious Seddon correspondence *re* the application of our system of ventilation to the London Custom House, and hoping to be favoured with an early reply to the foregoing queries,

We have the honour to be,

Your obedient servants,

(Signed) ROBERT BOYLE & SON.

P.S.—We beg formally to protest against the awards given for ventilators, on the grounds that our self-acting air-pump ventilator was not tested, and that we were not invited to submit it for the purpose of being tested along with the others, and that therefore the awards given do not show that the ventilators receiving them were justly entitled to them.

R. B. & S.

As it is evident, from the position Mr. Clark has taken up, that the above letter has failed in its purpose, and that we may expect but scant satisfaction at the hands of the gentlemen—whoever they may be—who formed the jury, we will now appeal to the executive through its head, his Grace the Duke of Buckingham.

We are, yours truly,

ROBERT BOYLE & SON.

64 Holborn Viaduct, Jan. 2, 1885.

Our letter to Mr. Clark will be a partial reply to Mr. Banner's, which appeared in your last issue. We have now to say that, had we known at the time that Mr. J. P. Seddon formed one of the jury on ventilation, we should have lodged a formal protest against his acting in that capacity, on the grounds that he was declaredly antagonistic to us, and that he was also the advocate of another system

of ventilation (Mr. Banner's), upon which he would also have to adjudicate. Had we been invited to send our air-pump ventilator for the purpose of being tested, which we were not, and had we been aware that Mr. Seddon was one of the jury, we should most certainly have declined. And it has yet to be explained why the names of the jurors were kept so strictly secret in spite of all our attempts to ascertain them.

With respect to the value of the tests, we have already, through the medium of your columns, expressed our opinion, and that opinion we not only maintain, but are prepared to prove, is correct. As to the efficiency of Mr. Banner's or any other ventilator, as compared with the air-pump ventilator, there is no surer or more crucial test than the test of time, and no better judge than the public. It is not for us to boast of how long our ventilators have now been in use, nor of the number of buildings, public and private, in almost every country in the world, which we have successfully ventilated, nor of the almost incredibly large number of ventilators which we have sold during the last fourteen years. The fact that they are known and extensively used in every quarter of the globe is in itself, we think any reasonable and unbiassed person will admit, sufficient proof that the air-pump ventilators have been found to satisfactorily answer their purpose, or they would not have been so generally adopted. But that is not all. We recently made an appeal to the principal architects in the United Kingdom to be favoured with their experiences of our ventilating appliances, and we received, in *immediate response*, over 400 most valuable testimonials, amongst which are to be found the names of almost every leading architect in the kingdom. We humbly think that the testimony of gentlemen who all speak from extended practical experience, such as Mr. Arthur W. Blomfield, Mr. Arthur Cates, the late Sir Gilbert Scott, Sir William Thompson, Dr. B. W. Richardson, the late Professor Macquorn Rankin, &c., will have a little more weight with the public than the pottering experiments of a few amateurs, whose ideas on the subject are possibly as vague as their practical knowledge is limited. Mr. Banner is simply making a farce of a serious matter when he again offers his bellicose challenge to 'single combat' for 100*l.* a side, &c. Considering that he has now offered this challenge to almost every ventilator maker in the country, and we believe has been also himself challenged, we should have thought that by this time he would have seen the folly of his conduct, and the ridicule he was bringing on the cause of sanitary science by his treatment of it as if it were the 'prize ring.' If Mr. Banner is so very desirous that his name should be handed down to posterity as one of the great sanitary reformers of the present age, let him, instead of giving away his 100*l.* in the way he proposes, expend it in applying his system of ventilation gratuitously to one of our city hospitals or homes, and then invite his friends and the press to witness what he has done. We can assure him that, if he does this, he will accomplish his desire, and at the same time have done a good deed, which will be doubly satisfactory.—We are, yours truly,

64 Holborn Viaduct, ROBERT BOYLE & SON.
Jan. 2, 1885.

Sir,—From their letter on page 285, Messrs. Kite & Co. would have it to be inferred that their 'exhaust ventilators' were tested by Mr. Clarke at the Health Exhibition testing room; but, from all I can learn as yet, they had no 'ventilator' tested there, but only their *chimney can*! Consequently, while they might deserve the Gold Medal for their inlet and outlet ventilators—in the latter case their chimney breast ventilators being meant—it is a different matter to speak of 'winning' the Gold Medal with an appliance which was never in the contest at all.

Kite's ventilator, with two vertical openings on the principle patented in 1846, is, in my opinion, a very poor exhaust appliance, and I said so several years since; and

this opinion is further confirmed by experiments lately made by me with said ventilator, as modified now by Messrs. Kite & Co. from the old diamond shape to a round section. On the other hand, I consider their chimney can, which I have also tested against my chimney can, to be a very good one. Yet, had I known that chimney cans were to be tested, and had sent in my own, Kite's might have been second instead of first. I say so because I tested both on December 27, when in six testings of one minute of each the one gave 1,328 feet of up-current, and the other 1,300 feet; the highest in one minute of the one being 308 feet, and of the other 320 feet, so that the two cans might be said to be six of the one and half-a-dozen of the other.

I also before this tested Kite's exhaust ventilator for a 4-inch soil-pipe against mine for a 3-inch pipe, the pipe of Kite's ventilator being only $3\frac{1}{4}$ -inch bore to go *inside* the pipe, while the pipe of mine was $3\frac{3}{4}$ inches in diameter. The best result of each showed Kite's in four minutes 1,400 feet up; my one, 2,140 feet up; plain pipe, 1,510 feet up.

I again tested Kite's 4-inch ventilator with its $3\frac{1}{4}$ -inch pipe against my 4-inch one, with its $4\frac{1}{4}$ -inch pipe to go over the 4-inch pipe. In this case the highest Kite's gave in one minute, with its shut side to the wind, was 470 feet, while the lowest my own gave was 750 feet. With its open side to the wind, however, the highest of Kite's was only 150 feet a minute; the lowest of the plain 4-inch pipe was 370 feet a minute, and its highest 500 feet.

How does the result of these experiments bear upon or tally with the attempt made by Messrs. Kite to make the public believe that their exhaust ventilators had been tested at the Health Exhibition, and that they had got the Gold Medal thereof?

Gold Medals were given to three firms in the ventilating section, including a French and a German firm; but, as said section comprised a variety of appliances, it is quite possible the Gold Medal in no case had anything to do with *wind-acting* exhaust ventilators. An outlet ventilator into a chimney, or one acting by gas or machinery, has nothing to do with wind-acting ones.

Glasgow, Jan. 3.

W. P. BUCHAN.

We should not have noticed this particular point any further, but for Messrs. Kite & Co.'s letter, which we feel somewhat surprised at after the confession they made. Now they say all right-thinking people will deprecate the attacks made on the jury and tester. Surely, after they have acknowledged theirs was a chimney-top and not a ventilator which was tested, they cannot wish the public to believe that the tester was a competent man to perform such a duty. Does it not show his utter incapacity to do so? In their letter they would have one and all overlook their previous letters, and give heed to the sympathy they offer to the man who undertook a duty, and 'by their own showing' was incapable of performing. We think the tester should have objected to the chimney-top being included in the list of ventilators. It was sent as a ventilator, it was tested as a ventilator, but it was not a ventilator. How was it, if everything was done conscientiously, this was not discovered by the judge? In our opinion it shows one of two things, either the incapacity or the insouciousness of the judge. Messrs. Kite & Co. say their chimney top or apparatus, which took the Gold Medal, was made on the same lines as their turret ventilator; so much more is the reason why the judge should have objected to it, as being wrongly entered. If A had a sailing yacht entered for a race, and B had a steam yacht built upon the same lines as the sailing yacht, would that entitle B to enter his yacht for the same race, simply on the plea that it was built upon the lines of a sailing yacht? Would not the umpire or the judge at the entering discover this before the race commences. If not, they would be unequal to the duty they undertake. Should it be overlooked, and all entered as sailing yachts, the race completed, and

the steam yacht came in first, then comes the question—'Is she a sailing vessel, and entitled to the prize?' We wait for no answer to this question. Should the prize be handed over to the owner of the steam yacht, we think so much blame could not be attached to the recipient of the prize as the donor. We have said before, we do not begrudge any successful competitors their award; but we think we should have been spared the harassing remarks of 'without malice or favour,' for this fairly implies that all exhibitors must have had an equal chance. It is very easy for a prize-winner to use language so modest and becoming, but not so easy for one who has been refused a fair trial 'as we have been;' and without the reason or explanation why we were so treated. To use the language of Messrs. Kite & Co., we are inclined to think the public will deprecate our lot, rather than facts made known of the jury and tester. As to the means so applied for testing, we say there is not a particle of truth in it; and we are in a position to prove it. There is a means of testing the merits of a ventilator as easily as a gauger can gauge a cask of spirits as to quantity and quality, which he can do to the greatest exactness by means of proper apparatus; but he might as well put a two-foot rule into the cask to find the strength as to put an anemometer into a ventilator to see what extracting power there is in it where a forced current is set up. Let anyone fix a ventilator, the bottom coming down into a room, make the air therein quiescent, and no natural element acting upon the outside of the ventilator: see what the result will be. In the case of the late testing all the natural element was cut off from the outside, and a forced current set up from the inside, which brought about a passing through the anemometer an amount of cold air, and whichever passed the most forced current was considered the most effective ventilator. Nothing can be more misleading. In proof of this take an instance that has within a week from this date been demonstrated in the following manner:—A 14-inch ventilator was fixed at the head of a grand staircase, with very large rooms at the foot of the stairs. To the ventilator were attached five injection tubes. At the ceiling line and at the bottom of the ventilator when the gas was alight, the temperature was 75°; the ventilator was passing, by the anemometer's register, 78,000 lineal feet of air per hour; this was then reduced to 60,000 feet per hour, and the temperature was also reduced to 62° and 65° maximum and minimum; that being so, when was the ventilator doing the work it was intended for? These facts lead us to the conclusion that we are right in what we have always said, that cold air passing through a ventilator is not only unreliable as to its merits, but to a great extent destroys the power of extracting hot air. Over and over again we have proved this to be the case, and in the presence of a commissioner to a trade journal, who took a great interest in the experiments made with ventilators. It was our intention to have written a few letters upon the art of testing ventilators, but we are sorry to find that some of the trade journals who claim to be the leading organs have closed their columns to such articles, and thus deprived their readers of any information that they themselves are unable to give.

Sir, we feel sure your object always is to give space for matter upon scientific questions and to set the wronged righted, and you will therefore give space and insert this in your next issue, and oblige

EDGAR ALDOUS & Son,
Ventilating and Sanitary Engineers,
2 Elmhurst, Upton Lane,
Forest Gate, E.

Jan. 1, 1885.

A NEW DEPARTURE IN HOUSE DRAINAGE.

Page 253 in the SANITARY RECORD for December bears the above title, and it is, I think, worthy of the attention of all who possess, or who aspire to have, authority in the design and execution of private sanitary work.

This is my opinion because I see in Mr. Ebbetts' work (there described) evidence of that thoughtfulness in the application of the principles which commended themselves to him which is indispensable to the attainment of satisfactory results, but which, I believe, is not always sufficiently exercised.

My object in writing is, by calling attention to its importance, to encourage such thoughtfulness, especially among the many new and earnest workers in sanitary science who are being brought forward by the growing demand in the public mind for good domestic sanitation. Is it not distinctly needful for such, indeed for all, sanitary workers to remember that an intimate knowledge of good principles, though necessary, is not by any means sufficient? What is urgently called for is thought in the application of these principles to the conditions of each particular case. This thoughtfulness is clearly manifest in Mr. Ebbetts' paper, and it is a quality which finds ample room for exercise in the design and the carrying out of sanitary work where inattention to 'points of detail' may so easily prove disastrous, and may wreck the usefulness of an excellent general design.

It is given to only a few workers to lay down principles which prove themselves worthy of general acceptance, but the honour of applying these well can be attained by everyone who makes it his purpose.

In writing this I am not to be taken as agreeing with all that Mr. Ebbetts says; in fact, I am unable to do so. It is not so much his scheme as his method of going about his work which is, I think, suggestive. But Mr. Ebbetts might reconsider whether the 'inspection holes' (which he shows) are called for on a drain which is straight, which is laid to a gradient of as much as 6 inches in 10 feet, which is terminated by a sweeping eye and by a chamber, and which is provided with a special flushing tank. He might also reconsider whether the waste-pipes of a housemaid's sink and bath, even if 'trapped,' should have been allowed to remain joined to a soil-pipe. But perhaps, in this case, Mr. Ebbetts had no authority to alter internal arrangements.

As to the design of the ventilation being 'new,' Mr. Ebbetts will find his principle laid down, and at least permitted, by the 'Model By-laws (issued by the Local Government Board) with respect to New Streets and Buildings,' clause 65, sub-section (i) (b). The details specified there are, however, somewhat different from those in the case described.

I do not write, however, with the view of criticising the paper in question, but from a strong wish to point out the great use of *painstaking thoughtfulness* in putting into practice good sanitary principles, and the wide scope which exists for its exercise by individual workers.

ALEXANDER A. KYD,
An Engineer of the London Sanitary
Protection Association.

London, Dec. 31, 1884.

I have read with some interest Mr. D. J. Ebbetts' paper upon 'A New Departure in House Drainage,' in the SANITARY RECORD of December, because the principle he has applied, and advocates, is a child of mine, and I have applied it to a large number of buildings, and with success.

If you refer to the proceedings of the Annual Conference at the Society of Arts, on National Water Supply, Sewage, and Health, May 15 and 16, 1879, p. 144, you will see a paper by me upon the double check system of house drainage, and I extract from it the following:—

'In the present day, every closet should be constructed so that it may be flushed by about two gallons of water; this quantity of water, if it were possible to be forced at once into the 4-inch soil-pipe, would form a solid plane of water, about a yard long, and would, in descending, push before it with considerable power the air in the pipes; and if the soil-pipe were 10 feet long, 10 feet of air would

zed, and forced out of the open end of the pipe, the time air would pass into the top of the soil-pipe, and follow the water piston, so that during it was acting as a displacer of foul air, it would be the vacuum with fresh air; and, if I had not objection to mechanical valves, I could easily construct that would retain the yard of water in the soil-pipe, being released suddenly, would act with very effect; but as in practice I have found it is desirable to have the water for pan-flushing by a large pipe, say one, taking care that the valve which allows the escape from the flush tank, and also the way into the pan, be of equal capacity to the pipe; a good object, and the descent of water passing down the pipe, acting in a zigzag and spiral form, produces a similar to the solid water piston described; and it is the advantage of being more gradual in its action, and displacing more foul air than though it acted

All open-top soil-pipes, having no exit pipes, of large extent, this piston power for displacing and those having an opening near the ground (as systems) act as I have described, but with the object, that upon each occasion of the closet being action of foul air is forced out of such openings, and in course of time very objectionable, produce a low level disagreeable odours, and in the four doors and windows. The double check is the advantage of being free from the objections noted out. The soil-pipes and drains being open end, so that any foul air in them may be displaced easily acted upon, and I have found that a warm water thrown down a kitchen sink, has a current of air to circulate through the pipes; a hot water-tap, allowing a small quantity of water to pass down the drain constantly, has the effect, night, and at other times, caused a moderate current in one direction, and also in the arrangement when one pipe is at the back of the house, and at the front, should the sun shine upon one pipe, reduced will cause a free circulation so long as it does occasionally untrap the waste-pipe traps, and it is warmer than the other. Of course, the systems described do occasionally act one against the other; there may be times when the water piston forcing air in one direction, and the bucket of the other, but in practice this has but little effect on the successful working of the system, for upon which I have found the drain and soil-pipes very free of foul gases.

From the above extract it will be seen that Mr. Ebbetts' system has been anticipated, and I may say that houses designed by me upon this system as early as 1863, and I exhibited at the Health Exhibition, London, of the double check system. I take exception to his scheme, such as waste-pipes connected to the rain-water pipe, because such an arrangement becomes ducts for air to enter the house, being contaminated by passing through slimy ducts, and soil-pipes are properly laid, I see no need of special sweeping ends.

It is seldom a hot flue can be met with to fix an objection against; the idea, though, is a good one when applied.

HENRY MASTERS.

Dec. 30, 1884.

December number of the SANITARY RECORD, article called 'A New Departure in House Drainage.' Mr. Ebbetts says he connected a soil-pipe to a water-pipe with the drains by means of 'quadrant bends'—apparently in order to prevent an escape of gas. Will you kindly tell me in your next issue if it is a 'quadrant bend,' such as Mr. Ebbetts describes.

F. W. JORDAN.

House, Heaton Chapel, Stockport.

'Quadrant bend' is simply a stoneware drain-pipe

moulded to the shape of a quadrant of a circle—a curved drain-pipe in fact. It was used in the works referred to to connect the vertical with the horizontal pipe with an easy bend, and was mentioned in the article because such connections are generally made with traps, which interrupt the flow of the water besides producing other inconveniences.—D. J. EBBETTS.]

PATENT INSPECTION OR ACCESS-PIPES FOR HOUSE DRAINS.

On p. 279 there is illustrated and described, and also highly approved of, what is purported to be a new style of 'Access-pipe' for house drains, said to be invented by a Mr. G. C. Davies, of London. I doubt, however, he is rather late in bringing this longitudinal opening on the top of the pipe with a lid for same as a 'new invention,' seeing that I got an award of merit for it at the International Medical and Sanitary Exhibition, London, 1881; and it has also received two or more certificates of merit from the Sanitary Institute of Great Britain since then. These Access-pipes were patented by me at the end of 1879, and I have used them since in a variety of ways at a number of buildings, while many architects have used them on their drainage works. I mention some in the fourth edition of my book on 'Plumbing and House Drainage,' published two years since. These pipes of mine can be made of any suitable material—fireclay, stoneware, iron, lead, &c. Sometimes iron lids are used with the fireclay ones.

It is a pity for Mr. Davies that he is too late, but I cannot help that.

W. P. BUCHAN.

Glasgow, Jan. 5, 1885.

WATER FILTERS.

Our criticism of the 'International Filter,' as we stated at the time, was not prompted by Mr. J. J. P. Sawyer's 'challenge,' which is beneath our notice, but by your editorial paragraph. However, not to appear discourteous, we will in a few words reply to your correspondent's letter in the last number of the SANITARY RECORD.

There is no novelty whatever in his filter as far as its general arrangement is concerned. Thus, 'Gray's improved self-cleaning rapid filter' is almost identical with the 'International,' excepting the cone-shape of the filtering medium. Mr. Sawyer's proposal to use for the purpose of the 'fight,' as he pleases to express it, not his patented material, but animal charcoal, is contrary to common sense, for if there is any use in testing a filter it can surely only be in the form in which it is offered to the public. Any filter containing, say, coarse gravel only, through which the water would pass without being in any way purified, would, we submit, produce results similar to those claimed in the challenge. For this reason we drew attention in our last letter to the omission in the 'challenge' of any distinct reference to the most important question, which is the purification effected by the filtration. Your correspondent's observations do not remove this, for 'one week submitted to other tests, with permanganate, &c.' (point 6), refers, as it stands, merely to a testing of the filtering medium, and not of the filtered water. Even should the latter have been intended, the phrase quoted is too vague to do away with our objection. A point 11, to which he refers us with reference to the testing of the filtered water, does not exist, there being only ten points, as will be seen on p. 6 of your issue quoted above.

Declining further correspondence on this subject, we remain, Sir, your most obedient servants,

The Spongy Iron Filter Company,

Purveyors to the Queen by appointment.

22 New Oxford Street, W.C.

Jan. 2, 1885.

SANITARY JOTTINGS.

SANITARY.

VACCINATION IN SOUTH AFRICA.—The following extract from a private letter of an English medical man practising in the Orange Free State contains some remarkable recent instances of the efficacy of vaccination:—"Everybody in these parts is now convinced of the value of vaccination. There were many sceptics before the outbreak of the disease, but we have had so many conclusive proofs of the value of vaccination that no one here can doubt its efficacy. Among other cases I may mention that a small community of thirty-four Korannas were infected and tried to conceal the fact, but were not long successful. Three had been vaccinated last year. All except these three were stricken with small-pox, and eighteen died. The three vaccinated ones nursed all the rest but did not take the disease. On a Boer's farm I vaccinated the Boer and his children. His wife alone refused the operation; she alone caught small-pox. The whole family lived in a small house, and although exposed to contagion, not one of the others took the disease." The writer is Dr. George Davis, Government Doctor of Hoopstad, Orange Free State.

The Senate, after two days' debate, to-day adopted, by 96 votes against 21, a Bill for improving the sanitary condition of Naples. A sum of 100,000,000 francs is to be expended for this purpose during the next ten years. The works will be carried out under the direction of the Government, which will also guarantee a new loan, to be raised by the city.

Scarlet fever still forms the largest percentage of cases of zymotic diseases notified to the medical officer of health at Newcastle. It is also very prevalent in the surrounding district.

WATER SUPPLY.

The vicar of Esh has written to the Lanchester Rural Sanitary Authority requesting them to provide the necessary water supply and complete system of sewerage for the village of Esh, the inhabitants of which place at present suffer much for want of such provision.

Frequent complaints have been made recently both in Newcastle and Gateshead relative to the quantity and quality of the water supply. The public have suffered much annoyance from the supply being turned off for several hours at uncertain times without notice; when turned on again, the water has often been found unfit for domestic purposes.

CREMATION NOTES.

THE corner-stone of a new crematory temple has been laid on Mount Olivet, Long Island. Professor Felix Adler conducted the services. Twenty dead bodies are now awaiting its completion. The cost of cremation in each case will be from 10 dols. to 25 dols. The edifice is designed as a modified Grecian temple of brick and marble, 40 x 72 feet. The basement will contain in the rear the furnace, which will be constructed chiefly of fire-brick, and will be adapted to coke with a regenerator. The incinerating chambers will consist of retorts which will exclude all fuel and flame from contact with the body, and from which the volatile products of the incineration will be carried into the furnace for recombustion. Incineration will take place at a temperature of about 2,500° Fahrenheit. It will require about forty minutes per hundred pounds of the subject, and will leave about 4 per cent. in weight of a pure pearly ash. No smoke will be visible, and no odour perceptible during incineration. The basement will also contain a refrigerarium, so that the body may be kept, when desired, awaiting the arrival of friends from a distance; also a calidarium for cases of possibly suspended animation, the high temperature of which will

induce speedy evidences of life or death, as the case may be. There will be, also, in the basement an urn room and an atelier. This last will be used also for making autopsies, which will be required in all cases wherein it is not clear that death is the result of natural causes.

The Lancaster, Pennsylvania, crematorium, built by the Lancaster Cremation and Funeral Reform Society, was dedicated on Nov. 25. The building occupies an elevated position in the southern part of the city. The remains of the body subjected to incineration were reduced to ashes in an hour.

The New Orleans Cremation Society has purchased a square of ground near the city, and a furnace for burning the dead will be built without delay. The society is one of the largest and wealthiest in the country.

We give below for the information of our many readers who are interested in the subject of cremation the text of the circulars lately issued by the Council of the Cremation Society of England, who have now decided to open their crematorium at St. John's, Woking, Surrey, for the cremation of those bodies, relative to which the requirements of the Society are complied with. Any further information desired can be obtained on application by letter to the honorary secretary, W. Eassie, C.E., 11 Argyll Street, London, W.

The Council of the Cremation Society of England purchased, in the year 1878, a freehold site at St. John's, Woking, in Surrey, especially adapted by position for the purpose, and erected thereon a building, with an apparatus of the most approved kind, for effecting cremation of the dead. They next tested it by experiment, and found that it accomplished the purpose required without occasioning nuisance of any kind. Since that time the place has been maintained in perfect order, but has not been used, owing to a doubt raised, soon after the date referred to, as to the legality of adopting the process at present in this country. A recent decision, however, of Mr. Justice Stephen declares that the cremation of a dead body, if effected without nuisance to others, is a legal proceeding. Under these circumstances the Cremation Society feel it a duty to indicate, without delay, those safeguards which they deem it essential to associate with the proceeding in order to prevent the destruction of a body which may have met death by unfair means. They are aware that the chief practical objection which can be urged against the employment of cremation consists in the opportunity which it offers, apart from such precautions, for removing the traces of poison or other injury which are retained by an undestroyed body.

The following, therefore, are the conditions on which the employment of the crematorium will alone be permitted by the Council:—1. An application in writing must be made by the friends or executors of the deceased. 2. A certificate must be sent in by one qualified medical man at least, who attended the deceased until the time of death, and one also by a second medical practitioner, both unhesitatingly stating that the cause of death was natural, and what that cause was. These conditions being complied with, the Council of the Society reserve the right in all cases of refusing permission for the performance of the cremation, and, in the event of permitting it, will offer every facility for its accomplishment in the best manner.

CREMATION SOCIETY OF ENGLAND.

This Society was founded to Promote the Objects set forth in the Following Declaration—"We disapprove the present custom of burying the dead, and desire to substitute some mode which shall rapidly resolve the body into its component elements by a process which cannot offend the living, and shall render the remains absolutely innocuous. Until some better method is devised, we desire to adopt that usually known as cremation."

The Conditions of Membership are:—1. Adhesion by signature to the above declaration; 2. The payment of an annual subscription of 1 guinea, or a single payment of 10 guineas.

APPLICATION FROM RELATIVE, EXECUTOR,
OR FRIEND OF DECEASED.

I, (Name) _____
 (Address) _____
 (Occupation) _____ hereby request

the Cremation Society of England to undertake the
 Cremation of the body of _____
 and I certify that the deceased expressed no objection
 (orally or in writing) to being cremated after death.

A Medical Certificate of the cause of death is enclosed.

(Signature) _____

NOTE.—When no Medical Certificate is enclosed, an
 Autopsy must be made and certified by a Medical Officer
 appointed by the Society, and at the expense of the
 Applicant or of the Estate of the deceased.

MEDICAL CERTIFICATE OF THE CAUSE OF
DEATH.

To the Cremation Society of England.

CERTIFICATE NO. I.

Address _____

I hereby certify that I attended

(Name) _____

(Address) _____

(Profession or Occupation) _____

aged _____, that I last saw h _____ on _____

18 _____, that h _____ died on _____ at _____

and that the cause of death was as hereunder written.

	Cause of Death.	Time from Attack till Death.
(a) First.	•	
(b) Second.	•	

* The time for each form of disease or symptom is reckoned from
 its commencement.

Signed * _____

Professional Title _____

Address _____

Date _____

* The first General Practitioner will sign here.

This Certificate must be signed by a Registered Medical
 Practitioner.

CERTIFICATE NO. II.

I certify that I have, in relation to the expressed
 desire that the deceased should be cremated, carefully and
 separately investigated the circumstances connected with
 the death. I declare that there are no circumstances
 connected with the death which could in my opinion
 make exhumation of the body hereafter necessary.

Signed * _____

Professional Title _____

Address _____

Date _____

* The second General Practitioner will sign here.

This Certificate must be signed by another Registered
 Medical Practitioner.

The Cremation Society reserves to itself the right of
 refusing to carry out cremation in any case without assign-
 ing any reason.

Particulars as to Terms, &c.

The cost of performing cremation and everything con-
 nected with it, is, as compared with an ordinary funeral,
 small.

Ample arrangements are made for the conveyance of a
 body from London to the crematorium, St. John's, Woking,
 Surrey, on reasonable terms. Messrs. Garstin & Sons, of
 5 Welbeck Street, Cavendish Square, London, W., the
 well-known undertakers, provide a hearse and arrange for
 the removal from any part within the four-mile postal
 circle to the crematorium itself. The entire cost of this is
 5*l.* 10*s.*

The charges for the use of the crematorium, for all attend-
 ance there, and all expenses connected with the ceremony,
 beside the cost of transit above named, amount, for the
 present, to 6*l.*

In all cases two clear days' notice are necessary to arrange
 for a cremation, and if the body is not removed by Messrs.
 Garstin & Son, it should be stated, for the information of
 others, that a suitable cotton or linen shroud and an ordi-
 nary shell must be provided, and the arrival at the crema-
 torium must be arranged at a certain time agreed upon, in
 order to insure all proper attendance and reception.

It must be understood, unless special arrangements are
 made to the contrary, that only one representative of the
 deceased is permitted to attend at the cremation. The
 ashes will be placed at his disposal, and can be dealt with
 as he directs.

PARKS AND OPEN SPACES.

*The law condemns both man and woman
 Who steals the goose from off the common;
 But lets the greater felon loose,
 Who steals the common from the goose.*

ON Jan. 12 the disused burial-ground adjoining St.
 Mary's, Whitechapel, was opened to the public. It
 has been tastefully laid out by the Rev. A. Robinson,
 vicar, and the caretaker is supplied by the Metropolitan
 Public Garden, Boulevard, and Playground Association.
 This ground is in an exceedingly important position, being
 at the junction of the great thoroughfares of Commercial
 Road and Whitechapel Road.

Through the generosity of a member of the Metropolitan
 Public Garden, Boulevard, and Playground Association
 the sum of 100*l.* has been offered to the vestries of Lam-
 beth, St. Pancras, Mile End Old Town, and St. George's-
 in-the-East, with a view to their supplementing it by a
 similar sum, and expending it in planting trees in the
 chief thoroughfares of their respective parishes.

The Consett Iron Company have promised to set apart
 an excellent site, called the Blue Mountains, for the pur-
 pose.

poses of a public park, provided the Consett and Benfield-side Local Boards will jointly engage to fence and lay out the ground in an appropriate manner.

Mr. George Hedley, J.P. of Burnhopeside Hall, in the county of Durham, has, at his own expense, planted a number of lime and chestnut trees in the village of Lan-ches-ter, thereby adding much to its natural beauty; he has also in certain places protected the trees with a substantial iron fencing, 10 feet in height. At a public meeting, held on the 14th ult., in the national schoolroom of the village, under the presidency of Dr. Wilson, a vote of thanks to Mr. Hedley for his munificence was carried by acclamation.

THE HOUSING OF THE WORKING CLASSES.

*'How best to help the slender store,
How mend the dwellings of the poor?'*

LONDON LOCAL BOARDS AND SANITATION.—In his evidence before the Royal Commission on the Housing of the Working Classes, Mr. Hugh Owen, permanent secretary to the Local Government Board, furnishes some significant particulars of the relations of the London district authorities to the sanitation of the dwellings of the poor. Mr. Owen states that there are twenty-three vestries and fifteen district boards under Schedule A of the Metropolis Local Management Act, making, with the City, thirty-nine authorities. It is almost invariably the case that but a small number of persons take part in the elections to these boards, the event being not much known among the inhabitants; and Mr. Owen has heard of such a case as of a vestryman being elected by three votes on a show of hands. The sanitary officers appointed by these boards are not in any way subject to the Local Government Board either as to tenure of office or as to salary. The proportion of population to each inspector of nuisances in Islington is 56,000, in St. Pancras it is 59,000, in Greenwich it is 65,000, in Bermondsey it is 86,000, and in Mile End it is 105,000; whereas in St. George's-in-the-East the proportion is one inspector to 15,000 population, in Woolwich one to 12,000, in St. Olave's, Southwark, one to 11,000, in St. James's, Westminster, one to 9,000, and in St. Giles's one to 9,000. By the Sanitary Law Amendment Act of 1874 it is provided that the Local Government Board may, at its discretion, by notice in the *London Gazette*, declare the 35th section of the Sanitary Act of 1866 to be in force in any part of the metropolis, and it also confers upon the local authority additional powers as to the regulations which may be made. The regulations may extend to ventilation of rooms, paving and drainage of premises, the separation of the sexes, and precautions to be taken in cases of any dangerously infectious or contagious disease. Before December last these enactments had been put in force in only twenty-two districts, and in only thirteen of these had regulations been made. Application was necessary before 1874, but since that time the Local Government Board might have put this enactment in force at any time without application. Asked why that power was not exercised until last year, Mr. Owen explained that the mere putting in force of the enactment would be of no avail, unless the local authority were willing to make regulations, and, when the regulations were made, to enforce them. The fact that they did not apply for the authority was regarded as showing that they were in-different in the matter, and were it not for the pressure of public opinion recently, it would have been quite useless, Mr. Owen thinks, to have put these regulations in force. There is some evidence of that view in the fact that in several cases where on their own application they had the power conferred upon them they never exercised it, and made no regulations under the statute. As regards those places in which the enactment had been put in force, the Local Government Board issued a circular asking what

action had been taken with reference to regulations under the Act, and it was found that only two have been really acting upon them—Chelsea and Hackney. As regards the other districts, the effect of their answers was in some cases that they had almost forgotten that they had the powers. There was one case where they proposed to have the enactment put in force, although it had been 'put in force' a long time previously. The Local Government Board, when they put the enactment in force, supplied the vestries and district boards who had already made regulations with a series of suggestions for regulations for their consideration. These regulations admit of the inspection of lodging-houses at any time, including the night, night inspection being chiefly desired with a view of detecting overcrowding.

EXHIBITIONS.

PARIS INTERNATIONAL EXHIBITION, 1885.

It is the intention of the Minister of Commerce to have here exhibited a collection of teaching material and specimens of results from French schools. The Educational Section in Group V. (classes 38 to 44) will comprise Plans, Models, &c., of Schools and other Institutions; Teaching Appliances, Gymnastics; Printing and Books; Stationery and Office Furniture. In the Scientific Annexe will be included Hygienic discoveries, Instruments and Apparatus for Medicine and Surgery. The London offices are at 1 Castle Street, Holborn, where applications for the remaining available space and all communications from British exhibitors should be addressed to Mr. Edmund Johnson, Commissaire Délégué.

NOTICES OF MEETINGS.

THE METROPOLITAN PUBLIC GARDEN, BOULEVARD, AND PLAYGROUND ASSOCIATION.

By permission of Lord Brabazon, a meeting was held at 83 Lancaster Gate, on the 6th inst., Mr. Ernest Hart in the chair. Sixty-four new members, including many prominent persons, were elected, and the half-yearly financial statement was laid before the Council. The secretary announced that the Newington Vestry had agreed to this over and maintain the playground on the site of Horsemoor Lane Gaol, and that the Surrey magistrates had agreed to accept this change in their tenants, thus relieving the Association of a heavy burden. Fountains have been presented for Ebury and Canonbury Squares, the latter garden being now much used by those persons who originally objected so strongly to its being opened to the public. The council agreed to offer seats for the thoroughfare at Christ Church, Westminster, and to improve the garden at Christ Church, Batenon, according to a plan supplied by Miss Wilkinson. The new work taken in hand included the proposed opening of the Beaumont and Princess Square burial-grounds, Trinity Square, and Tower Garden E., Arlington and Union Squares, N., the Marylebone burial-grounds, and a vacant space in New Oxford Street, and the meeting adjourned after having considered the forty-one separate items of which its agenda consisted.

CANTOR LECTURES.

THE second course of Cantor Lectures at the Society of Arts are on 'Climate and its Relation to Health,' by Dr. G. V. Poore, and the lectures are fixed for Monday evenings, Jan. 12, 19, and 26. The first lecture of the course was delivered on the evening of Monday last, and dealt with the chief constituents of climate, latitude, height, light, and barometric pressure. The second lecture on Jan. 19, will treat of the effects of soil, drainage, and vegetation upon climate; and the subjects of the third lecture, on Jan. 26, will include the chief sources of atmospheric impurities, both inorganic and organic; climatic diseases and climatic health resorts.

APPOINTMENTS UNDER THE PUBLIC HEALTH ACT.

MEDICAL OFFICERS OF HEALTH.

ADDENBROOKE, Edward Homfray, M.R.C.S. Eng., L.S.A. Lond., has been appointed a Medical Officer of Health for the Kidderminster Rural Sanitary District until June 24 next, at the rate of £30 per annum, *vice* Roden, deceased.
BOURNS, Charles, L.K.Q.C.P. Irel., L.R.C.S. Irel., has been re-appointed Medical Officer of Health for the East Division of the Godstone Rural Sanitary District, at £30 for one year.
BRIGHAM, Henry George, L.R.C.P. Edin., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Kidsgrove Urban Sanitary District, at £20 per annum, until March 25, 1886, *vice* Thomson, resigned.

Robert, M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Buckingham Rural Sanitary District, at £55, and for the Buckingham Urban Sanitary District, at £15, both for one year.

Incis, L.R.C.P.Eng., L.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Heanor Urban Sanitary District, at £20 for one year, *vice* Woolley, resigned.

John Winter, M.R.C.S.Eng., and L.M., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Kettering Sanitary District, at £30 for one year.

Wid Aneurin, L.R.C.P.Eng., and L.M., M.R.C.S.Eng., has been appointed Medical Officer of Health for the Flint Sanitary District, at £20 for one year, *vice* Jones, resigned.

Wilfred William Ernest, M.B.Cantab., M.R.C.S.Eng., Lond., has been appointed Medical Officer of Health for the Walsby Rural Sanitary District, for four years, at £250 per annum, rising £50 each year to £400, *vice* the Poor-Law Medical Officers, whose appointments have expired.

Thomas Porter, L.R.C.P.Eng., and L.M., M.R.C.S.Eng., has been appointed Medical Officer of Health for the Walsby Rural Sanitary District, at £114 for one year, *vice* whose appointment has expired.

Jonathan Atkinson, M.D.Univ.Glasg., has been re-appointed Medical Officer of Health for the Haslingden Urban Sanitary District, at £80 for one year.

James, M.B.C.M.Univ.Eng., L.R.C.P.Eng., L.R.C.S.Eng., has been appointed Medical Officer of Health for the Walsby Rural Sanitary District, Wiltshire, at £80 for one year, *vice* Gordon and Hartley, whose appointments have expired.

Arthur Wightman, M.R.C.P.Eng., M.R.C.S.Eng., has been re-appointed Medical Officer of Health for the Budleigh Urban Sanitary District, Devonshire, at £20 for one year.

Robert, M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Godmanchester Urban Sanitary District, at £20 for one year.

Thomas, M.R.C.S.Eng., and L.M., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Market Harborough Rural Sanitary District, at £70 for one year.

William Ellis, L.R.C.P.Eng., L.R.C.S.Eng., has been appointed Medical Officer of Health for the Pudsey Urban Sanitary District, at £40 for one year.

Frederick, M.D., M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the West Division of the Stone Rural Sanitary District, at £30 for one year.

Alfred Gordon, M.B., C.M.Univ.Eng., has been re-appointed Medical Officer of Health for the Rhayader Division Rhayader Rural Sanitary District, Radnorshire, at £20 per annum, *vice* Richard Richardson, L.R.C.P.Eng., L.F.P.S., deceased.

William Lanham, M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Horsham Urban Sanitary District, at £15 for one year.

Benjamin Arthur, M.D.Univ.Lond., M.R.C.S.Eng., has been appointed Medical Officer of Health for the Nottingham Urban Sanitary District, at £500 per annum, *vice* a year for travelling expenses, *vice* Seaton, appointed to be, Chelsea.

Robert Archibald, M.D.Univ.Glasg., has been re-appointed Medical Officer of Health for the Lunsdale Rural Sanitary District, at £25 for one year.

RES, CLERKS TO GUARDIANS, INSPECTORS OF NUISANCES, &c.

Mr. George, has been appointed Assistant Surveyor to the Shirley Local Board and Urban Sanitary Authority, at £100 per annum.

Mr. Robert, has been elected Chairman of the newly-formed Llandysilio Local Board and Urban Sanitary Authority.

Mr. Alfred Henry, has been re-appointed Public Analyst for the Borough of Wakefield for one year.

Mr. William, has been appointed Inspector of Nuisances for the Forest Rural Sanitary District, at £40 for one year, and for the Highways, at £125 per annum, from year to year.

Mr. William Henry, has been re-appointed Inspector of Nuisances for the Royal Leamington Spa Urban Sanitary District, at £100 per annum.

Mr. James, has been appointed Surveyor and Inspector of Nuisances to the Longridge Local Board and Urban Sanitary Authority, at £72 per annum, *vice* Kirby.

Mr. Thomas John, has been re-appointed Inspector of Nuisances for the Evesham Urban Sanitary District, at £70 for one year.

Mr. Charles Edward, F.C.S., F.I.C., has been appointed Public Analyst for the Parish of St. Mary Abbots, Kensington, at 20s per annum for not less than 500 analyses, and fees for scale, *vice* Cleaver.

Mr. J., has been elected a Member of the Longridge Local Board and Urban Sanitary Authority, Lancashire, *vice* Kay, resigned.

John, has been re-appointed Inspector of Nuisances for the Mowbray Urban Sanitary District, at £25 per annum, *vice* years.

Mr. Lewis William, has been appointed Surveyor and Inspector of Nuisances to the Cheshunt Local Board and Urban Sanitary Authority, at £175 per annum, *vice* Mr. Lewis Dewey, deceased.

Dyer, Mr. Bernard, F.C.S., F.I.C., has been appointed Public Analyst for Southend, Essex, at 20s. 6d. for each analysis of food, and 21s. for each analysis of water.

GOTCH, Mr. James Alfred, has been appointed Surveyor to the Kettering Local Board and Urban Sanitary Authority, at £75 per annum, *vice* Johnson, deceased.

GRICE, Mr. William, has been re-appointed Inspector of Nuisances for the Hoole Urban Sanitary District, at £20 per annum, for three years.

HAMP, Mr. H. J., has been appointed Surveyor to the Swindon New Town Local Board and Urban Sanitary Authority, at £180 per annum, *vice* Jolliffe, deceased.

HAGUE, Mr. Joseph, has been appointed Surveyor to the Town Council and Urban Sanitary Authority of Bury St. Edmunds, at £250 per annum, *vice* Siggers, deceased.

HELLIWELL, Mr. John, has been elected a Member of the Stocksbridge Local Board and Urban Sanitary Authority, Yorkshire, *vice* Fox, resigned.

HUDSON, Mr. P. J., has been elected Chairman of the Stocksbridge Local Board and Urban Sanitary Authority, *vice* Fox, resigned.

HUDSON, Mr. Thomas Charles, Secretary to the Bucks and Oxon Union Bank, has been appointed Treasurer to the Corporation and Urban Sanitary Authority of Buckingham, *vice* Carter, deceased.

HUGHES, Mr. Thomas, has been appointed Clerk, Surveyor, and Inspector of Nuisances to the newly-formed Llandysilio Local Board and Urban Sanitary Authority, Montgomeryshire.

HUMPHRIES, Mr. George, has been elected a Member of the Tipton Local Board and Urban Sanitary Authority, *vice* Mason, deceased.

JEEVES, Mr. Edmund, has been appointed Surveyor to the Melton Mowbray Local Board and Urban Sanitary Authority, at £50 per annum, *vice* Johnson, deceased.

JOWETT, Mr. J., has been re-appointed Inspector of Nuisances and Surveyor for the Lancaster Rural Sanitary District, at £150 for one year, instead of £100 per annum for five years, as before.

MARSHALL, Mr. John, has been re-appointed Inspector of Nuisances for the Lunsdale Rural Sanitary District, Lancashire, for one year.

MATTHEWS, Mr. William, has been elected a Member of the Dawlish Local Board and Urban Sanitary Authority, *vice* Longley.

McKERRAN, Mr. Andrew, Branch Manager of Lloyd's Banking Co., has been appointed Treasurer to the Walsall Guardians and Rural Sanitary Authority, *vice* Blackburn, resigned.

MILLS, Mr. James, Solicitor, has been appointed Town Clerk and Clerk to the Urban Sanitary Authority of Beverley, at £200 per annum, *vice* Crust, deceased.

MITCHELL, Mr. Alexander, has been appointed Surveyor to the Bedwellty Rural Sanitary Authority, Monmouthshire, at £120 per annum.

NORTH, Mr. J. W., has been appointed Surveyor to the Skipton Local Board and Urban Sanitary Authority, Yorkshire, at £130 per annum, *vice* Ramsden, appointed to the Chiswick Local Board and Urban Sanitary Authority.

OGDEN, Mr. W. H., has been appointed Collector to the Mossley Local Board and Urban Sanitary Authority, Lancashire, at £100 per annum, *vice* Dempsey, resigned.

PEITMAN, Mr. Thomas, has been elected a Member of the Herne Bay Local Board and Urban Sanitary Authority, *vice* Wachter.

POTTS, Mr. Joseph Nixon, Branch Manager of the Manchester and County Bank, has been appointed Treasurer to the Stockport Guardians and Rural Sanitary Authority, Cheshire, and to the Hayfield Guardians and Rural Sanitary Authority, Derbyshire, *vice* Hooley, deceased.

RHIND, Mr. Peter Smith, has been appointed Treasurer to the Corporation and Urban Sanitary Authority of Liverpool, at £1,000 per annum, *vice* Tweedie, deceased.

ROYLE, Mr. Evered, has been appointed Surveyor to the Shirley and Freemantle Local Board and Urban Sanitary Authority, at £100 per annum, *vice* Pim, resigned.

SARGENT, Mr. Alfred Frank, has been elected a Member of the Hove Board of Improvement Commissioners and Urban Sanitary Authority, for the St. John's Ward, *vice* Young, resigned.

SMITH, Mr. Henry, has been appointed Public Analyst for the Plumstead District, at £100 per annum, and 2 guineas for each analysis of water, *vice* Wigner, deceased.

THOMPSON, Mr. Stodhart, has been elected a Member of the Levenshulme Local Board and Rural Sanitary Authority, *vice* Rayson, resigned.

TVE, Mr. John Frederick, has been appointed Public Analyst for the Borough of Monmouth, at £4 4s. per annum, 20s. for each ordinary analysis, and extra remuneration for special work, *vice* Foster, whose appointment has expired.

VANSTONE, Mr. Robert, has been elected a Member of the St. Thomas Local Board and Urban Sanitary Authority, *vice* Cuthbertson, deceased.

WARD, Mr. William Henry, Banker, has been appointed Treasurer to the Tetbury Local Board and Urban Sanitary Authority, and to the Tetbury Guardians and Rural Sanitary Authority, *vice* Wood, resigned.

WARNE, Mr. John, has been appointed Treasurer to the Ottery St. Mary Local Board and Urban Sanitary Authority, *vice* Gresswell, resigned.

WATSON, Mr. Henry, has been appointed Collector to the Longridge Local Board and Urban Sanitary Authority, at 30 shillings per cent. commission, *vice* Kirby.

WHITTAKER, Mr. A. H. (who has been acting pro tem.), has been appointed Collector to the Corporation and Urban Sanitary Authority of Macclesfield, *vice* his father, deceased.

WITTS, Mr. John W., has been appointed Surveyor and Inspector of Nuisances to the Skelton and Brotton Local Board and Urban Sanitary Authority, Yorkshire, at £172 per annum, *vice* Cross, appointed Surveyor and Waterworks Manager to the Loughborough Local Board and Urban Sanitary Authority.

VACANCIES.

MEDICAL OFFICER OF HEALTH for the Cheltenham Urban Sanitary District: £300 per annum. Application, 26th inst., to E. T. Brydges, Town Clerk.

MEDICAL OFFICER OF HEALTH for the Llandysilio Urban Sanitary District: £11 per annum. Application to Thomas Hughes, Clerk to the Authority.

MEDICAL OFFICER OF HEALTH for the Ilkeston Urban Sanitary District.

PUBLIC ANALYST for Herefordshire. Application to the Clerk of the Peace, Hereford.

SURVEYOR to the Town Council and Urban Sanitary Authority of Shrewsbury. Application to the Town Clerk.

SURVEYOR to the Buxton Local Board and Urban Sanitary Authority. SURVEYOR AND INSPECTOR OF NUISANCES to the Town Council and Urban Sanitary Authority of Honiton. Application to the Town Clerk.

INSPECTOR OF NUISANCES for the Wavertree Urban Sanitary District: £120 per annum.

INSPECTOR OF NUISANCES for the Llandysilio Urban Sanitary District: £11 per annum.

LOCAL INTELLIGENCE.

The Worcester Guardians and Rural Sanitary Authority have been invested with urban powers, &c., under Sects. 155 and 156 of the Public Health Act, as to the line of building frontage.

The Guildford Guardians and Rural Sanitary Authority have been invested with urban powers, &c., under Sects. 157 and 158 of the Public Health Act as to the making of by-laws with respect to the making of new streets and the structure of buildings within the contributory place of St. Nicholas, Guildford.

The enactment contained in Sect. 90 of the Public Health Act, authorising the making of by-laws as to houses let in lodgings, has been declared by the Local Government Board to be in force within the Watford Local Government district.

There were 130 applicants for the Surveyorship of the Swindon New Town Local Board and Urban Sanitary Authority, at £180 per annum.

AMBLESIDE LOCAL BOARD AND URBAN SANITARY AUTHORITY.—The first election of Members has resulted in the return of Messrs. Thomas Backhouse, John Brown, James Gibson F. M. T. Jones, Thomas Newton, H. Redmayne, Godfrey Rhodes (Colonel), John Russell, and Edward Tysen.

The Ventnor Local Board and Urban Sanitary Authority have voted £100 to Mr. R. S. Scott, the Surveyor, for his services in connection with the Act of Parliament obtained last session authorising the construction of a new pier and the making of other improvements.

The East Grinstead Guardians and Rural Sanitary Authority have, by agreement with Mr. W. Orrin, the Inspector of Nuisances and Surveyor, whose duties have been materially altered by the formation of a Local Board, fixed his salary at £120 per annum (£110 and £10) from Lady Day next.

Dr. Henry J. Alford, Public Analyst for Somersetshire, in his report to the Epiphany Court of Quarter Session, reported that he had analysed 819 samples during the year, of which 52 were adulterated. During the last quarter he had analysed 292 samples, of which 24 were adulterated, viz., five of mustard, six of coffee, two of cocoa, three of gin, three of brandy, four of whisky, and one of rum; but none were prejudicial to health.

New Year's Day was celebrated by Mr. William Whitaker, the chairman of the Rawmarsh Local Board and Urban Sanitary Authority, in entertaining the officials and servants to the number of twenty-five, at a dinner. Mr. Whitaker occupied the chair, and Mr. Benjamin Simcox the vice-chair.

The Wortley Guardians and Rural Sanitary Authority have been invested with the powers, rights, &c., of an Urban Sanitary Authority. 1. Under s. 153 and 155, and under sect. 160, so far as it relates to naming streets and numbering houses, and to ruinous or dangerous buildings, within the whole of the district. 2. Under sect. 66 within the contributory place of the Chapeltown Special Drainage District. 3. Under sect. 150, within the contributory place of Chapeltown Special Drainage District so far as regards 'Piece End' and 'Whitefield,' and within the contributory place of Ecclesfield so far as regards 'Taplin Road,' except as to sewerage, and under sect. 152.

Mr. A. B. Creeke, the Town Clerk and Clerk to the Urban Sanitary Authority of Burnley, has been presented with a solid silver salver and an illuminated address by the principal officials of the Corporation, in celebration of his majority as an official, and of his silver wedding.

The Abingdon Guardians and Rural Sanitary Authority, at their last fortnightly meeting, unanimously passed the following resolution upon the motion of the Rev. E. H. Robinson, seconded by Mr. W. H. Comins:—'That the members of the board, in recording the death of their late chairman, J. S. Bowles, Esq., desire to express their high appreciation of the manner in which he at all times discharged the duties devolving upon him, and do express their deep sympathy with Mrs. Bowles and the family of deceased at the great and irreparable loss which they have sustained.' A copy of the resolution was ordered to be forwarded to Mrs. Bowles.

Mr. William Foster, Public Analyst for the Borough of Monmouth, stated in his quarterly report that nothing had been submitted to him for analysis during the year.

NOTES AND QUERIES.

Having for some time back been in the receipt of Queries relating strictly to sanitary work, and which it would be easy to without having to refer our correspondent to competent professional advisers, we have opened a column in which to register such Queries thereto as can fairly be expected from us; and our self and readers are invited to make such use of this column as to benefit themselves and the community. Both Queries and will, however, be subjected, if unnecessarily long, to a strict cut.

140. RETURNS OF SICKNESS AND DEATHS.

I have recently been appointed health officer for a sanitary without, I confess, much previous experience of the duties now receive from the Local Government Board forms of be filled up which are to include tabular statements of the and of the sickness amongst paupers in my district. I plied for statistics of the deaths to the registrar, but he ally wants to be paid for them, and my salary is too small my incurring the expense. My fellow-practitioner as poor-law medical officers will let me have access to the but decline to do more. Am I expected to get out for the particulars required; and ought there not to be some ment made for my receiving the information I want for the of my office before it is too late for anything else than dry returns?

[As our correspondent has but recently joined the noble sanitary workers, we forgive him a crime for which he otherwise be no benefit of clergy; that, namely, of not knowing the contents of his SANITARY RECORD. If he will turn to the number for February 14, 1879, he will find this self-cultury solved. But for his comfort, and that of others in it we may observe that in order to enable medical officers to discharge efficiently the duties imposed upon them by Government Board, it is essential that they should be with returns of the deaths registered in their districts. that information on the subject is required to be sent to is a secondary consideration, the primary use of such returns to make the medical officer acquainted with any infectious existing in his district, so that he may take the necessary prevent the spread of infection. For a similar reason to sickness amongst paupers—which are the only class there is at present any sort of general registration of deaths needed by the medical officer. We recommend our correspondent to lay these considerations before his sanitary authority them to give instructions for the information he wants to him. He may properly add that the law officers of the Government decided that sanitary authorities may lawfully pay for deaths from registrars, and that the fee to registrars section 28 of the Registration of Births and Deaths Act at twopenny for each return and twopenny for every death in such return. As regards pauper sickness, arrangements be made by the sanitary authority with the guardians in of which their clerk would be instructed to copy from the medical officers' relief lists the new cases which are at each meeting of the guardians, and forward the copies to the cal officer of health.—Ed.]

141. TAILORS' SHOPS.

What should I do in cases such as the following? A tail 47 by 8 by 7; average number of men seventeen; no gas burning almost all day in winter; and work going on night occasionally. There are, of course, also a number very hot irons in the room. The cubic space per man is 155 feet, and the air is so hot that the smallest opening causes an intolerable draught. At present not on invidious thing to demand admission to and to report workshops, but, in the absence of information of the some definite nuisance, I doubt whether the medical health has a right to demand admittance. If you think duty of inspection in such cases is clearly laid upon us, for our guidance would be very acceptable.

[It is sufficient to have reasonable grounds for suspecting shop to be overcrowded or injurious to the health of the to take action with reference to it. No doubt tailors often disgracefully overcrowded and ill-ventilated. would be as well in the first instance to direct the attending factory inspector to the matter; but our correspondent is aware that by Section 91 of the Public Health Act a we kept in a cleanly state, or badly ventilated, or so overcrowded work is carried on as to be dangerous or injurious to the those employed therein,' is legally a 'nuisance,' which dealt with as provided in section 94 *et seq.* of the Act. gives power of entry to the sanitary officers into any premises the purpose of examining as to the existence of a nuisance therein.—Ed.]

142. MORTALITY FROM CHOLERA.

What was the number of deaths from cholera in London in 1849 and 1866? [14,125 in 1849, and 5,596 in 1866.—Ed.]

ORIGINAL PAPERS.

THE INFLUENCE OF LEASEHOLD TENURE ON SANITARY QUESTIONS.

By J. VESEY FITZGERALD, Barrister-at-Law.

THE reports recently issued by the Foreign Office on the systems of tenure of dwelling-houses existing in the various countries of Europe contain much that is interesting and instructive. English law, as we know, differs in origin and in many essential particulars from the laws of other civilised countries; and though, as a whole, English lawyers consider it to be superior to any of the systems established elsewhere, no one denies that we might with advantage borrow some provisions from the laws of other countries. The reports in question have been procured at the instance of those who consider that our system of building-leases ought to be abolished, and freehold tenure, at any rate for dwelling-houses, substituted for leasehold. They show that the English system is unique, inasmuch as leasehold tenure is unknown in some countries, and uncommon even where it is permitted by law; and they also show that there is no such agreement among the laws of other countries as should lead us to think that the system established anywhere else must necessarily be the right one, and that systems which differ from it must necessarily be wrong. We do not propose here to attempt to analyse the merits and demerits of the different continental systems of tenure, except so far as those systems provide restraints against the creation of nuisances, or the erection of buildings which may be detrimental to the neighbourhood. In this respect, as in others, the laws of different countries vary greatly; and, if our law as to household tenure is to be altered, we should observe the merits and demerits of the various systems, so as to profit if possible by the example of our neighbours.

In England at present the erection of buildings in towns is subject to certain restrictions imposed by the general law. New buildings must have the approval of the local authority and be constructed in accordance with their by-laws; certain regulations as to ventilation and drainage and similar matters must be complied with; and the site and size of the house must be such as not to interfere unduly with already existing buildings. Not only is the local authority of each town charged with the duty of seeing that these provisions are carried out, but any neighbour whose light and air is interfered with, or the value of whose property is diminished by the erection of a new building, may be able to prevent the threatened injury or to recover damages for it through the medium of the law courts. Besides these provisions which affect all houses of whatever tenure, a practice has grown up of inserting covenants in leases which bind the tenant to conform strictly to the requirements of his landlord. For instance—if a landlord wishes to lay out his land as a residential estate, he binds his tenants to erect houses of a certain minimum value, and sometimes according to plans to be approved of by himself, and he also binds them not to use their leases for any trade or business which will interfere with the character of the neighbourhood. Such covenants are strictly interpreted and enforced by our courts, and as a consequence there are to be

found in or in the neighbourhood of towns, which elsewhere are devoted to unpleasant trades or manufactures, districts occupied solely by private residences. Every tenant on such an estate may have an interest entitling him to enforce the covenants against his co-tenants, and consequently during the currency of the leases, the character of the neighbourhood is preserved, if the houses are all leasehold. The owner of a freehold plot, however, cannot be restrained from using his ground as he likes, so long as he avoids erecting a nuisance, and erects a building in conformity with the by-laws of the local authority. He may turn his house into a shop or manufactory, and so change the character of the neighbourhood and lower the value of the houses for residential purposes, without his neighbours having any right of objecting. The system of building-leases in use in this country, thus, among other things, tends to impose restrictions on changing the character of a neighbourhood, and to prevent the spread of industries which are detrimental to enjoyment.

The reports now published to some extent enable us to see how far restrictions on the building of houses, and on the uses to which they may be put are possible in other countries. In several instances the reports have evidently been furnished by persons who were not specially conversant with the law either of England or of the country to which they referred, and their value is consequently diminished. But, making allowances for their generality, it seems that in all the more important and more civilised countries of Europe restrictions of some sort are imposed by law, in the interests of the community, on the erection of houses in towns. These restrictions of course vary, but the right of the State or of the municipality to impose them is universally recognised. In many States also, though apparently not in all, a neighbour who is injured by the erection of a new building, or by the use to which it is put, has a right to invoke the interference of the courts of law, sometimes with the object of obtaining a decree in the nature of what we call an injunction, and sometimes merely for the purpose of obtaining damages. The right of the original owner of the soil, or of those who derive their title from him, to object to the erection of any particular house or to the establishment of any particular trade, is much less universally recognised.

Leases, such as we are used to in England, are comparatively rare, and in some countries are impossible. In France and in Belgium leases similar to those in England are sometimes granted, and the observance of covenants in them can be enforced by law. Besides this, restrictions may be imposed on land, which are *binding on a purchaser* as well as on a tenant. Such restrictions are called in Belgium 'servitudes,' while the French report gives them no specific name; in both countries not only the vendor but purchasers of other lots from him can, for their own benefit, enforce these restrictions against a purchaser who infringes them. Similar restrictions on the use of plots of ground which have been purchased are recognised in Germany, and may be enforced by the vendor or his successor in title to whom the right has been conveyed, but only when the restriction and the title of the person who claims to enforce it have been duly registered in the State 'grund buch.' Purchasers of neighbouring plots have no right of action, unless the vendor has expressly granted it to them. In certain suburban districts in Denmark it is customary to sell plots for

building burdened with conditions or provisos called "servitut." This word, 'though a very comprehensive term, applies usually to the obstruction of a view, to the erection of unsightly or unsafe buildings, and to their being applied to noxious or offensive trades.' 'It is a nice question of law as to the qualification necessary for making application to the courts in cases of breach of servitut;' and the report, while stating that it is usually the business of the municipality, at the instance of the landlord, 'to see that a clear and adequate decision be arrived at,' omits to say whether the purchaser of an adjoining plot has a right of action, or what is to happen if any one considers the decision of the courts to be obscure or inadequate. In Norway restrictions exist similar in character to the Danish 'servitut.' These restrictions are for an unlimited time. The sellers as well as neighbours, in so far as the restrictions affect the latter, can enforce the restrictions with the assistance of a tribunal.

The above are the principal countries in which restrictions at all similar to the covenants in English building-leases seem to be generally recognised. It is worthy of remark that such restrictions are generally applied not to leasehold but to freehold land; and consequently that easements which an English lawyer would consider as repugnant to the idea of freehold tenure are found to be not incompatible with freehold tenure in other countries.

In several other countries in Europe, such as Baden, Bavaria, the Netherlands, Italy, and Wurtemberg, the sale of land for building is treated as a question simply of private contract. If the parties to the contract insert any special conditions in it, those conditions may be enforced. Such conditions are, however, said to be very unusual; and, where they are inserted, only the parties interested can enforce them. There seems to be no means by which neighbours or purchasers of adjoining plots can enforce the observance of conditions which would be beneficial to themselves. In certain other countries, according to the reports, private restrictions on the uses of land purchased are not only never inserted in the contracts, but are actually prohibited by law. In Russia and Poland it is said, 'As to restrictions upon purchasers of houses, it appears that none are legally allowed.' And the Swiss report says:—'Land may be sold in large or small plots, but in all cases unconditionally; no restrictions, accordingly, can be imposed saving obedience to ordinary municipal regulations in or near towns.' This language would seem to imply that contracts as to the user of land by the purchaser are forbidden. Whether that be so or not, it seems certain that they are practically unknown; and that, in effect, a purchaser of land or of a house is free to do what he likes with it, subject only to municipal laws, but without paying any regard to the wishes of the previous owner or of his neighbours. In England we have become accustomed to restrictions on the uses to which leasehold property may be put, and we recognise that such restrictions may often actually enhance the value of the property to which they apply; but we should find it difficult to enforce such restrictions against a freeholder. If compulsory powers of enfranchising leases are to be given by law to the tenants, it certainly seems desirable to provide that restrictions on the use of the plot enfranchised, which are in the nature of easements for the benefit of the neighbourhood, should be retained. The German plan of registering such easements, and

of only allowing those registered to be binding, security against doubt as to what the easement in a particular case may be. In case of enfranchised leaseholds, the title would be clear, and the difficulties which stand in the way of requiring compulsory registration of easements would not exist. We think, therefore, that the proposed alteration in the English law, security against the character of a neighbourhood being spoilt, by the conduct of the occupiers, may be given by turning existing easements into easements and requiring their registration, and that a right of action should be given to any person who could show that he was aggrieved by any interference with such easement. If the security to others against the misconduct of a tenant which is now given by leasehold is to be preserved, and the change will do no harm from a sanitary point of view, nor need it interfere with the enjoyment of comfortable dwellings.

Leasehold tenure in England has been often criticised on other grounds, as being responsible for the existence of the worst slums in our large towns. It is said that the most insanitary dwellings are generally houses held under leases which have expired, and where, consequently, it is difficult to lay out money for repairs or improvements. These assertions are no doubt sometimes founded. It would, from our point of view, have been well if the reports furnished to the Sanitary Office had given us some information which would enable us to compare other countries with our own. But the reports are generally silent on this subject. They mention that leases are uncommon on the Continent, but in some countries are unknown. Yet from other reports we know that overcrowded and insanitary dwellings exist in the towns of other countries besides England. It would seem, therefore, that the building-leases system is not responsible for all the failures which are sometimes ascribed to the system, but is instrumental in preserving districts and towns from being treated in a manner which is not only unpleasant even where it is not absolutely injurious to health.

Whenever the threatened legislation for a new system is brought forward, we hope that the Government will be taken to preserve the useful elements of the existing system, and that alterations will be made for the sake of change by persons who are not, at any rate, tried to realise what their own system would be. The reports which have been issued from some extent what is the state of the law in other countries, and we have some idea of the condition of the inhabitants of those countries, whether preferable to or inferior to our own. The reports are worthy of perusal, and may serve to show what changes in our law may be desirable, and where it is well to leave existing institutions undisturbed.

SCARLET FEVER AT NEWCASTLE.—Scarlet fever has been reported to the medical officer of health for Newcastle as having occurred during the night ending Jan. 31, 1885.

MORTUARIES.—At the last meeting of the Local Board it was resolved that a mortuary should be provided for the district. The chairman was informed of the scandals that had arisen from the use of an old stable for the purpose.

COTTAGE BUILDING.

By G. H. BLAGROVE, A.R.I.B.A.

THE moral as well as the sanitary benefits conferred upon the labouring classes by sufficiently commodious dwellings cannot be overrated, and the means whereby those advantages can be obtained, with a due regard to economy, form part of a question which has for years past been recognised as one of national importance. Time was when the agricultural labourer was scarcely so well housed as the horses and cattle of his employer; but we are happy to think that, except in a few isolated cases, such treatment has become obsolete.

The average amount of accommodation requisite for a labouring man with a wife and family comprises not less than five rooms—viz., a living room and washhouse or scullery upon the ground-floor, and three bedrooms above. This allows separate rooms for boys and girls—a highly important consideration. The three-roomed arrangement, consisting of a living room, washhouse, and one bedroom, only provides for accommodating one or two very young children, and does not afford the most economical type of cottage residence.

The living room, of which the size may vary between 120 and 150 feet superficial, should have a boarded floor, raised at least one step above the ground level, in order that it may be properly ventilated and kept dry. Wood blocks laid upon concrete are much in use now for floors, but it is to be doubted whether they will continue popular, from their liability to retain moisture. The entrance doorway to the living room should be protected from the weather by an enclosed porch; and when several cottages are built contiguously in rows, one porch may be made to serve for every two, the doors of the two living rooms being placed upon the skew, cutting off the corner of each room, so as to reduce the width of the porch to a less dimension than would be required for the full width of two doorways, and thereby to leave more frontage space available for windows. In semi-detached cottages, where economy is best served by bringing the fireplaces into the centre of each block, so that one chimney stack may avail for both tenements, it will be desirable to keep the entrances apart, because it is a disadvantage to have a doorway upon the same side of the living room as the fireplace. Under these circumstances we may either build an external porch at each end, or form an internal lobby by cutting a square portion out of the room. It is not necessary to provide a lobby in addition to a porch, unless the lobby can be made to contain a staircase, by which an ascent can be gained without passing through the living room.

It should be remembered that the occupants of small tenements prefer doing all their cooking operations in the living room during the winter, to obviate the necessity of having an extra fire for warming purposes, and that the living room should therefore be provided with a cooking range. In the summer, however, a fire in the living room would be unduly oppressive; and for summer cooking there should be a small range or stove in the washhouse besides the copper, which may occasionally be employed for culinary purposes, but whose main use will be for washing. A height of not less than eight feet from floor to ceiling should be arranged for the living room, which would thus contain from

900 to 1,200 cubic feet of air. The washhouse floor may be of cement, and some persons prefer making it one step lower than the living room floor, to preserve the latter from becoming wetted. However this may be, we should advocate placing the stairs between these two rooms, as most accessible from each, and as affording space beneath for a cupboard. If the total width be 12 feet or 13 feet, the stairs can easily rise by the aid of winders, so as to bring the top landing into a central position, with 8-inch treads and 8-inch risers—a sufficiently comfortable ascent. The superficial area of the washhouse may be from 60 feet to 100 feet, and it should have a small pantry attached. The water-closet or privy may be erected at a short distance from the dwelling, as at the end of the back garden, or in any other convenient situation, or it may be placed within the walls; but it should, in any case, be entered from the outside, and have no communication with the interior. The same observations apply of course to the dustbin. For this we recommend the galvanised-iron portable bin, now in vogue. It has a hinged flap at the top, but has no bottom, so that when full it has only to be lifted up, and the refuse can be removed with a shovel.

The principal (or parents') bedroom should not be of a less area than 100 feet superficial, and may be more with advantage. It should contain a fireplace, and ought to be 8 feet high in the clear from floor to ceiling. The two other bedrooms may be from 60 feet to 90 feet each in superficial area, and a fireplace in at least one of them is desirable. In calculating the requisite space for the accommodation of the inhabitants, it may be useful to remember that from 450 to 500 cubic feet of air is held to be sufficient for a healthy man during twelve hours. The ventilation also should be such as to allow of a constant renewal of the air, and this is the chief reason for providing fireplaces in bedrooms where possible. We must not forget, however, that a large amount of vitiated air will, when heated, ascend to a height above the chimney opening, and that perfect ventilation cannot be obtained without openings high up in the room, either in the ceiling or in the upper parts of the windows. The latter formed with top-lights hinged to transoms, so as to open inwards, and provided with side gusset-pieces, either of wood or zinc glazed, will admit fresh air without danger of draught. Below these there should be ordinary sashes or casements, or lights hung on central pivots, by which the rooms can be thoroughly purified when not in occupation. Openings formed at the opposite sides of the rooms will afford the most effectual means of doing this; and sometimes ventilation holes can be made to communicate with pipes, which may be carried above the roof and bent down.

For the external walls to cottages, brick or stone is of course to be preferred. Should flint or rubble be adopted, it will be more than usually a matter of importance to employ the best mortar. In concrete walling, either in blocks or *pisé* in moulds, especial care must be taken that the foundations are dry, and that the tops of the walls are sufficiently protected by overhanging eaves. We need scarcely insist upon the importance of a proper damp-proof course above the ground and below the floor in all walls. It may be of slates or tiles, a double course breaking-joint in cement, or of asphalt, or other suitable material, of which there are many now to be obtained. But whatever material be used for

walling, it is generally desirable to build hollow walls, to effectually exclude such damp as may accrue from driving rains. The thinner portion of a hollow wall should be built upon the outside, so that it may protect the greater thickness from the damp. The two thicknesses should be bonded together with the ordinary galvanised-iron cramps, formed with drips, to prevent any moisture from being conducted along them to the inner part of the wall. As the hollow space is liable to become a receptacle for accumulated moisture, it should be weathered outwards in cement at the bottom, and openings should be left here and there to allow the water to run out.

When, as in building with rubble or flint, it is found impracticable to execute hollow walls with a proper economy of space and material, the exterior may be protected against the weather with hanging tiles or slates, on those sides of the dwelling at least which are most exposed to damp winds—namely, the south and west. It is often customary to make up the level of the ground around cottages, paving it with a slope to fall away on every side. This is always desirable, especially in low-lying districts, where it serves to prevent accumulations of damp at the base of the walls. It will often be necessary in the country to provide some kind of receptacle for storing rain-water. The well-known water-butt is in common use, but an oval tank has been recommended to be placed between each pair of cottages, such tank to be about 7 feet by 4 feet and 3 feet 6 inches deep, divided into two compartments, with an oval flap to cover each side. The water from the down-pipes can be led into it through 4-inch earthenware pipes.

For cottage roofs tiles are generally admitted to be warmer than slates, and, as they involve less lead-work, they are perhaps cheaper on the whole. Probably the most economical form of roof will be found to consist in carrying a ridge parallel to the front, and from side to side of each dwelling. It will be safer to carry the party walls up to form raking parapets above the roof as a precaution against fire. In the interior, wall papers are not always as healthy as could be wished. They cannot be washed, they are prone to harbour vermin, and they constantly absorb foul air. White-wash, or colour in distemper, frequently renewed, is much to be preferred. Simple as the internal aspect must be from considerations of economy, we should never lose sight of the fact that everything tending to promote cheerfulness is conducive to health.

SPREADING SMALL-POX IN HULL.—Thomas Barrat, master of a small sailing vessel, was summoned before the magistrates at the Hull Police-court on the 2nd inst. for unlawfully and wilfully exposing his son, when suffering from small-pox, without proper precautions against spreading the disease, in a public place—viz., the Tigress Inn, High Street. The town clerk stated that the defendant's son contracted small-pox about the end of October, but defendant took no steps whatever to isolate him, but pursued his usual avocation, and proceeded from place to place, taking no precautions whatever to prevent the spread of the disease. The result was most disastrous, for no less than twelve cases of small-pox were directly traceable to the neglect of the defendant. Dr. Mason, medical officer of health, and other witnesses gave evidence in support of the charge. Mr. Twiss, the stipendiary magistrate, said it was terrible to think of the grievous results following this reckless conduct of the defendant. *He was fined 40s. and costs.*

DEEP DRAINAGE AND SEWAGE PURIFICATION IN THE BLACK COUNTRY.

(FROM OUR OWN CORRESPONDENT.)

[Third Article.]

THE municipal and parliamentary borough of Walsall, though not strictly speaking within what is correctly known as the Black Country district, adjoins the parishes of West Bromwich and Wednesbury, which are, and it occupies a very important place in the consideration of the sewerage question as affecting the district. The borough comprises the towns of Walsall and Bloxwich, and contains a population of some 59,000, occupying 10,700 houses, and covering 8,080 acres. The river Tame, the pollution of which with sewage has been the chief factor in bringing about the revolution in the drainage system of the district which has been going on since the passing of the Rivers Pollution Prevention Act, touches the southern boundary of Walsall, and also forms the boundary between the parishes of West Bromwich and Wednesbury, whence it flows through Great Barr, Perry Barr, Hamstead, and Aston, into Birmingham. The practice of sending raw sewage into the Tame had existed for very many years, becoming intensified as the population of the district increased. The Walsall Corporation were one of the first public bodies to move in the direction of remedying this evil, for as early as Sept. 18, 1876, the month after the passing of the Act, a resolution was brought before the Town Council bearing upon the subject, declaring that the time had arrived when it was imperative to take effectual measures to prevent either solid or liquid sewage being discharged into the river, or the brooks connected therewith, and directing the Sanitary Committee to carefully inquire into the whole matter. It being subsequently found that the committee could not give the necessary time to it, a special Sewerage Committee was formed, the members of which visited a number of towns in search of information and experience to guide them in dealing with the subject. Mr. Angell, C.E., was the first expert called to the assistance of the Corporation, and he was succeeded in 1877 by Mr. Hawksley, who inspected the various outfalls into the Tame, and reported to the Council on the subject at considerable length at their meeting in November of that year. He stated that the borough contained at that time a population of 55,000, and that the dry weather discharge of sewage into the river averaged twenty-five gallons per head daily, that being increased at times of ordinary rainfall to forty gallons per head. So that the quantity of sewage to be dealt with at that time was about one and a half million gallons per day in dry weather, and 2,400,000 in wet. There were two courses of treatment open to them—irrigation and precipitation. With regard to the former, although there were two or three sites which might be made available, they were either unsuitable, inconvenient, or would necessitate the outlay of an enormous sum. With regard to the precipitation system, the only difficulty was in utilising or otherwise getting rid of the deposited matter which did not possess manurial value. Seeing, however, that the water of the river Tame was never likely to be used for domestic purposes, he considered the defæcation of the sewage waters, so as to render them fit to be admitted into the

stream without becoming a nuisance injurious to health, could be effected by a primary precipitation with caustic lime, succeeded, when necessary, by a secondary precipitation by crude sulphate of ammonia. For this treatment from twenty to thirty acres of land would be sufficient, and the works, he estimated, would cost about 40,000*l.*, with about 1,500*l.* per annum for working expenses and cost of material.

Upon this the Sewerage Committee reported that, by the sheer force of circumstances, they were driven to the method recommended by Mr. Hawksley, of purification by precipitation. And, considering that the probationary period allowed by the Act had expired, that it must sooner or later be obeyed, and that they were even then liable to have a flood of litigation opened upon them by aggrieved parties, they advised the committee to decide in favour of Mr. Hawksley's scheme. The Town Council by a large majority, adopted that course, and in the early part of 1878 a Local Government Board inquiry was held respecting the matter. The troubles of the Walsall Corporation, however, had only then really commenced.

The Local Government Board, while not absolutely refusing sanction to Mr. Hawksley's scheme, expressed doubt whether it would afford an effluent sufficiently pure for discharge into the river; in which case, as was pointed out to them, some other system would have to be provided. The committee naturally shrank from the expenditure of forty or fifty thousand pounds upon an experiment which might have such a result, and a pause took place in the proceedings. They were not allowed to rest long, for on May 15 came a letter from the Town Clerk of Birmingham asking what steps the Walsall Corporation were taking in the matter. This aroused the committee to the necessity for further action, and they determined to throw the matter of preparing a suitable and efficient scheme open to public competition, offering premiums of one hundred guineas each for the best two schemes. Nine civil engineers responded, and sent in plans and schemes, upon which the borough surveyor, Mr. William J. Boys, reported. The result was the rejection of the lot, and the giving of an instruction to Mr. Boys to try his hand. Mr. Boys did so, and prepared a scheme in which he estimated the daily average quantity of sewage to be disposed of at forty gallons per head, reckoning the average rainfall at Walsall during the decade ending 1877 at 33.55 inches per annum, or 0.68 inch per week. In his scheme he proposed to divide the borough into two districts, viz., the towns of Walsall and Bloxwich, dealing with each separately by gravitation, without chemical treatment. The sewage of Walsall, he suggested, would fall by gravitation to Brockhurst Farm and land adjoining, where he proposed to deal with it in two ways. A portion of the sewage, which was largely diluted with subsoil and waste-tap water, and contained a quantity of trade refuse of various kinds from tan-yards, curriers, and other places where dyes were used, and which was of a particularly offensive nature, he proposed to discharge into subsidence tanks; but the sewage of a more domestic nature would be taken direct to the land, where the whole would be treated by a combination of subsidence and of intermittent downward filtration. The sewage from the Bloxwich district, being entirely of a domestic character, would be treated by the filtration system alone.

For carrying out the scheme he recommended a series of tanks 200 feet long by 100 feet wide, all or any part of which could be worked at the same time, and the bottoms being so arranged that all the deposit accumulating therein, with the exception of road detritus, could be pumped out and deposited on the adjoining land. The clarified sewage from the tanks would be purified by intermittent filtration on about seventy acres of land, and the other sewage would be purified by absorption on land planted with osiers. The cost of the land and works for the Walsall district he estimated at 47,686*l.* 5*s.* 6*d.*, and for Bloxwich 3,693*l.* 18*s.* 7*d.*; being a total of 51,380*l.* 4*s.* 1*d.* There would be three outfall sewers, costing 14,657*l.* 1*s.* 3*d.*, and the branch sewers were estimated to cost 5,576*l.* 11*s.* 5*d.*; making a total, with an allowance of 10 per cent. for contingencies, of 78,775*l.* 4*s.* 5*d.*, of which 61,898*l.* 16*s.* 9*d.* (apart from contingency allowance) was apportioned to Walsall, and 9,715*l.* to Bloxwich. This outlay he considered would provide for a population of 80,000, while the working expenses would be more than repaid by the crops and other produce of the sewage farm. Into the merits of this scheme Captain Hildyard held an inquiry on behalf of the Local Government Board on April 14, 1881. Opposition was made to the scheme by the neighbouring town of Wednesbury, on the ground that they too were about considering a sewerage scheme, and that the Walsall Corporation were seeking to appropriate for the purposes of a sewage farm land which the Wednesbury Local Board might themselves require, and were really taking more than they required. Point was given to the opposition by the fact that most of the land required by Walsall to carry out Mr. Boys' scheme was in the parish of Wednesbury, and, as was advanced on behalf of the latter, was the only available land suitable for their own use. A proposition was then made that the Wednesbury Local Board should unite with the Walsall Corporation in a joint sewerage scheme. With this phase of the question, however, we must deal in another paper.

VENTILATION OF PUBLIC BUILDINGS.—Messrs. Robert Boyle & Son, 64 Holborn Viaduct and Glasgow, are at present applying and have applied their self-acting air-pump ventilators and system of ventilation to New Residential Chambers, Park Lane, under the direction of Mr. Alfred Waterhouse, A.R.A.; Small-pox Ship *Endymion*, Long Reach, under the direction of the Metropolitan Asylums Board; New Shoe Factory, Starch Green, under the direction of T. Chatfield Clarke & Son; London Salvage Corps Station, Commercial Road; New Conference Hall, Stratford, E.; Victoria Central Electric Light Station, S.W.; New Hospital, Llandudno; Sanitary Hospital, Bournemouth; New Bodega, Birmingham; Liberal Club, Colchester; Female Penitentiary, Stoke Newington; and to the residences of the following noblemen and gentlemen:—Duke of Westminster, Bishop of Bristol, Earl of Northbrook, Earl of Breadalbane, Earl of Kenmare, Earl of Shrewsbury, Earl of Coventry, Earl of Cawdor, Sir Thomas Brassey, Sir Philip Rose, Sir Henry Elliott, Sir Frederick Leighton, Sir William Foster, Sir William Humphry, Sir Richard Bulkly, Sir Jones Ramsden, Sir John St. Aubyn, Sir Charles Trevelyan, and Sir Charles Brooke.

IN consequence of the strong representations of the medical officers, the governors of the Newcastle Infirmary have resolved to remove that institution to a new and more eligible site. It is at present surrounded by the cattle market and railways.

HOUSING THE EAST END POOR. SINGLE-ROOM TENEMENTS.

By H. M. MAVOR.

IN the SANITARY RECORD, of December last, attention was directed to the advance of this question in the East End of London, concerning those of the lower degree in the non-progressive scale of humanity; and going farther eastward, and following somewhat the same lines, further progress may be noticed in some buildings which have been recently started on the estate of Lord Strathmore at Shadwell. The class being catered for here consists principally of dock labourers, and such as are earning the fugitive and fitful fifteen shillings a week. These are mostly residents in the neighbourhood; that is to say, they are not of the migratory class who try to find work of varying kinds at varying periods and places, and for whom it has been recently stated, by no less an authority than Lord Shaftesbury in his evidence before the Royal Commission, that nothing can be done. Nothing short of an entire revision of the social scale can affect this last unfortunate and, it is to be presumed, unhappy class; but the fact that the monopoly of misery should be accredited to these beings in particular may possibly be doubted by many of another class whose anxieties are not of the physical heed of the morrow. However, this social revision (it would necessarily also be periodical) is too distant even to contemplate, and we turn again to the practical side of the question, so far as it is brought to date, and by the courtesy of Mr. George Drew, the architect to the estate, we learn much which may tend to its elucidation, and again we may derive wisdom from the East.

The principal point about the first block which is brought to notice is that it consists of single-room tenements, as these tenants would inevitably sublet any space not actually occupied. There are more than fifty of these rooms, reached by two staircases, and a gallery or verandah on each floor, an unusual and useful feature being double doors for the sake of warmth and privacy. Unlike the high buildings of seven floors to which we are accustomed, we here find but four, one advantage of this lessened height being that the cost of building is more than correspondingly reduced by the reduction in the requisite thickness of the walls, and a further saving is effected in scaffolding and labour pertaining to building at a great height. Where a more or less heavy ground-rent exists, which is often the case, it is necessary that a number of upper floors should bear a proportionate part of the expense, but in the case of freehold property such as the one under consideration this proviso is not called for. Upon looking at the plans one cannot fail to notice the marked liberality in the size of the rooms, which contain generally between 190 and 200 superficial feet, or, put in another form, say about 15 feet by 13 feet. To this may be added the unaccustomed height of the room, viz., 9 feet 6 inches, this being 6 inches more than is generally found in the large blocks in more central positions. This is another advantage of the omission of the top stories referred to, otherwise the addition of 6 inches to each of seven floors is a matter of consideration when the walls range about 70 feet in height.

Elementary as the culinary arrangements of these dwellings must undoubtedly be, it might be supposed

at first sight that any special provision in this respect would be unnecessary, but it must be remembered that the expenditure of a penny or two to create a fire and produce hot water is an item of importance if it be repeated often, to say nothing of the delay in so doing. A common kitchen has therefore been provided, with numerous ovens and facilities for meeting the limited but frequent requirements of a class much given to irregularity. Hot water may thus be obtained immediately at all reasonable hours, and the great advantage of getting hot water at the sink on each floor is also to be noted, and the moderate charge of sixpence per week is added to the rent of the room to pay the cost of a convenience which is often denied to the residents of a middle-class house. A club-room at the top of the building, to be furnished by the landlord, is again to be tried here, although, as has previously been pointed out, such a feature meets with no support. The reason for this probably lies in the fact that, managed in the way it has hitherto been done, it savours too much of patronage and discipline, which, being freely translated, would appear to be interference with the habits and customs of men who, by reason of their early training (or want of it), are wont to place greater reliance upon their own opinions than is warranted by the soundness of their views. It would, then, appear to be the best plan to allow them to manage or mismanage their affairs their own way; but we are then met with the insuperable difficulty of class distinction, which exists to a surprising degree even here. Gregarious they may be, but sociable—never. The architect of the Peabody Dwellings, speaking upon this subject some ten years ago, pointed out 'that the distinction created by wages is sufficiently important to justify its acceptance as a standard by which to divide the industrious poor into sections; and that no attempt should be made to mix up the interests of one section with another, nor should the hope be entertained that friendly intercourse will be encouraged between various sections by providing different classes of dwellings or accommodation in the same building or group of buildings intended for their use. Experiments have been made with this view, and opportunities have been given to the lower sections to associate more frequently with the upper, in the expectation that their manners and habits would become softened and improved under better influence. Shops have been provided as part of the buildings in thoroughfares where they were most likely to answer; workrooms have been added to the tenements of those engaged on piecework at home; reading-rooms and libraries have been supplied and furnished for the use of the better educated, and co-operative clubs have been supported to help the more provident; but none of these have answered. Those who consider that their wages entitle them to a superiority which their poorer fellow-workmen cannot claim, will not compromise their dignity by any condescension towards familiarity, and hold themselves aloof from them as if they were socially inferior; and these in their turn, though they may resent this exclusiveness, acknowledge their disadvantage, and do not care to leave the retirement which shelters their poverty, and saves it from exposure to neighbours who would grant it no pity. Very frequently they prefer to remain comparatively hidden in out-of-the-way courts and alleys, than to incur the risk of exposing their mean clothing and general wretchedness in open thoroughfares, where

they might have better accommodation at the same rent. Can sociability be evolved from the elements of never-ceasing discontent? Can a man be philosophical when the wherewithal to pay the next week's rent is problematic? Is not philosophy another name for indifference? The extension of club life, however, in better London is but of comparatively recent date, and it would be premature to say that clubs for the poor must ever be a failure.

Experience has proved that in buildings of this description it is more than ever necessary that a caretaker or superintendent should be provided, and in the large blocks of the representative companies the proportionate expense is very little; but where the rooms are limited in number it affects the rental appreciably, and in this case the rent is increased thereby from 2s. 6d. to 3s. 3d. Notwithstanding this, the rent is sensibly lower than equal accommodation (when it can be found) elsewhere, and this may be attributed to economy in building. All the work is done by the 'estate,' and, being in good hands, a considerable saving against contractors' prices is effected in labour and material. In consequence, we find that this is about the cheapest rate of building which has yet been attained for this class of work—in fact, it has reached the minimum compatible with soundness.

The wants of the tenants have been carefully recognised and studied throughout, and every opportunity is given them for comfort and cleanliness, ample fittings are supplied to the rooms, and a liberal laundry is provided on the roof, which, as usual, is flat, and affords the customary drying and playground. Last, but not least, the sanitary arrangements have been attended to on 'recognised principles,' there being two manhole inspection chambers between the building and the sewer, and a ventilated syphon trap between the sewer and the last inspection chamber.

Experiments of this kind mark a departure, and deserve to succeed on their merits; and if this work answers, as it may well be expected to do, it is the intention of Lord Strathmore to extend the field of operations: the limits of the field are practically unknown, and there is ample scope for movement.

THE following *à propos* perversion of Pope is taken from the *Pall Mall Gazette*:—

'From his sludgy bed
Old Father Thames dredged up his slimy head:
Deep in his mud the dirt-born brothers stood,
Who swell with sewage affluent his flood,
First authors of his stench as well as name,
The sluggish Isis and the turbid Thame;
The Kennet foul, where fungoid growths abound,
The Loddon slow, a sewer above ground;
Colne, whose dark stream his truthfulness just saves;
And chalky Wey, that's black howe'er Pope raves;
The Wandle, famed for every hue and stench;
The putrid Lea, thought fit our thirst to quench;
The honest Mole his own filtration tries,
And Darent stained with new impurities.'

A GAS COMPANY FINED.—The Newcastle and Gateshead Gas Company were summoned at the Newcastle Police-court on the 24th ult., for supplying gas with 28·98 grains of sulphur per 100 cubic feet, being 8·98 above the maximum allowed by the company's Act. The prosecution was the result of a resolution of the City Council in consequence of repeated complaints as to the quality of the gas, which it was suggested arose from causes which could be prevented—viz., defective purifying apparatus at the works. A fine of 10*l.* and costs was inflicted.

TYPHOID FEVER FROM DEFECTIVE WORKMANSHIP.

By ARTHUR NEWSHOLME, M.D.Lond.

Medical Officer of Health for Clapham.

THE following case is interesting as showing the evil results that may be produced by bad workmanship in sanitary matters.

In conjunction with Mr. Hobson, of Adam Street, Adelphi, I recently visited a public establishment, in which the caretaker's child was suffering from an attack of typhoid fever. The building had been erected within the last three years, and the proprietors of the establishment had since that time gone to considerable expense in order to make its sanitary condition perfect. It was consequently difficult to understand how or why typhoid fever should appear.

The child had not been away from home; an importation of the disease in this way was therefore out of the question. The milk supplied to the establishment had not proved deleterious in any other known cases. Finally, the overflow-pipe of the cistern was perfectly disconnected from the drain; there was no bath-room in the house; and the closets were in good condition, well flushed with water by separate service-boxes, and provided with a ventilating shaft in the shape of the rain-water pipe, the upper end of which was not near any window. This, although not the best method of soil-pipe ventilation, was held to be sufficient to clear the closets from the stigma of producing disease.

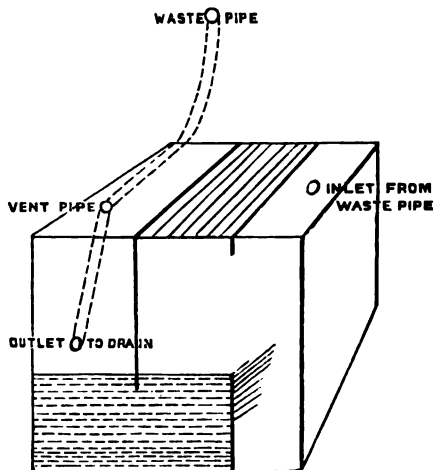
By a process of exclusion, we were therefore led to examine the drainage in the basement more carefully. Here was a lavatory containing several basins, and on entering this room (which had been closed for a day or two), a distinctly foetid odour was perceptible, quite different from the smell which frequently arises from decomposing soap in waste-pipes. The common waste-pipe from these basins led, without the intervention of a syphon bend, into a Mansergh's trap, just under the floor of an underground passage outside the basement rooms.

Mansergh's trap, as is well known, is a double-sealed trap, consisting of three compartments, in the first of which the waste-pipe dips under water, while the second compartment communicates with the external air by a grating, and is separated from the third by a partition reaching from the top of the trap and dipping below the level of the water in these compartments. The third compartment is provided with two openings, one leading to the drain, and the other intended for the attachment of a ventilating pipe to be carried up above the eaves of the house (*see fig. p. 352*).

In this instance, an unskilled workman had evidently fixed the trap, as the orifice intended for a ventilating pipe had been connected with the waste-pipe from the lavatory, and the water in its passage to the drain thus avoided the two first compartments of the trap. Similarly sewer-gases avoided the two water-seals of the trap, and found a ready entrance into the basement rooms, which were constantly occupied by the caretaker's family.

The case emphasises, if it were requisite, the urgent necessity for skilled instruction and registration of plumbers, as advocated by Mr. Ernest Hart, at the Health Exhibition. The only thing that can be said in mitigation of the plumber's ignorant work-

manship, is that Mansergh's trap is somewhat complicated in structure (and, we may add, cannot easily be cleaned out); but such ignorance would have been avoided if the plumber had received technical instruction concerning the appliances among which his work was to lie.



SECTION OF MANSERGH'S TRAP.

Dotted lines show improper connection of ventilating pipe with waste-pipe, and consequent direct communication of lavatory with drain.

ARTISANS' DWELLINGS.—PETTICOAT SQUARE.

By H. M. MAVOR.

ALTHOUGH the work of demolition of condemned buildings has proceeded at a greater rate than rebuilding, many efforts to provide superior accommodation are everywhere visible, and the least observant of those who run may readily read, and realise the fact that strenuous efforts are being made to supply an ever-increasing demand for one of the first requirements of mankind, viz, shelter. The extent of the clearly defined nuisance of overcrowding led to such stringent measures being taken, that the local authorities have frequently found that the powers which were conferred upon them became compulsory obligations; and this being so, the question of compensation to the owner becomes of serious import to a district which by its very nature is ill-prepared to incur heavy liabilities. It is easy to condemn and destroy a large number of houses, but the many vacant sites to be seen further prove how difficult it is to erect substantial buildings in the manner desired; not that the return upon the outlay is likely to be unremunerative, but the money for the necessary outlay cannot of course be found at any time or place, and this consideration did not receive sufficient attention when the Acts and their more stringent amendments were framed. When dealing with an *unhealthy area*, which perforce contains narrow courts and byways, the *building area* is reduced by reason of the increased width of the new courts which become roadways or improved courts of an appreciable width; thus an increased price per foot must be apportioned upon the land which is used for strict residential purposes. Were it not for the efforts of outside individuals and companies to take over the land from the local authorities, these latter would find themselves often irre-

trievably overburdened with a difficulty of their own raising; consequently the authorities are empowered to use their discretion, and offer every inducement to others to take the immediate responsibility. Contracts are thus entered into with trustees, companies, or individuals, to carry out the whole or part of the desired scheme upon such terms as prudence may dictate, or as may be found expedient; and in addition the Public Works Loans Commissioners may lend money for this purpose, such loans to be repaid with interest at not less than $3\frac{1}{2}$ per cent in fifteen years. By parity of reasoning the vestries are inclined to take a favourable line of action, and make a reduction in the rateable value; or, in other words, the rates are generally compounded—i.e. the owner becomes responsible at an agreed and lower figure whether the tenements are occupied or not; thus the house-to-house inquiry is avoided by the vestry, and loss on 'empties' or defaulters is fully made up by means of the regularity and certainty which is attained by having a responsible quarter to look to. Although in such cases the *gross* parochial income is apparently reduced to nearly one-half, the net return pays the authorities, and, indeed, induces them to acquiesce to a give-and-take arrangement beneficial to givers and receivers.

Among the foremost in the general movement may be instanced the Commissioners of Sewers in London, who have recently opened a large number of buildings in Petticoat Square. And this work is remarkable of its kind. Between the years 1877 and 1879 the site was cleared; one hundred and sixty-four tenements were demolished, including a large number of courts and alleys, and in consequence of this a number of poor Jewish families were turned adrift, the cost of clearing generally being over 120,000*l*. A proper system of sewers was constructed, and tenders were obtained for the erection of the intended dwellings, but as the value of the new buildings was deemed by the committee to be inadequate they were declined. The ground was again offered in 1880 without success, and in the following year the Commissioners themselves proceeded to undertake the work. They have been built within twelve months, at an inclusive cost of 78,000*l*., being the most expensive work of its kind yet attempted. The buildings, which are in five large parallel blocks, have shops on the ground-floor, and otherwise contain 539 rooms, which will accommodate nearly 1,000 persons. The staircases, which are many, are lined with white glazed bricks, which are from six to eight times the price of good sound ordinary bricks, but the advantages of cleanliness and durability are undoubted; the handrail (which is sometimes omitted with fatal results (see *SANITARY RECORD*, October 1884, p. 154), is a special made brick sunk into the wall, but is not so effective in use as the ordinary 'gas-pipe' handrail, this latter having also the advantage of cheapness. The fittings and finishings of the interior are unusually good and liberal, fireproof construction (which is now general) throughout is used, and every attention paid to sanitation and general spaces where dirt is usually harboured. One, two, or three roomed tenements can be obtained, but the rentals are not yet fixed, and it is difficult to see how any reasonable return can be expected, as everything has been carried out on such an expensive scale, but this is a point which the tenants will benefit by, as in no case will they pay an appreciably higher rent than do their neighbours for less desirable quarters. A working man's

requirements are not fixed by his ideas of life; he can afford but a certain sum per week, be the advantages offered him great or not. Buildings of this class offer a useful standard to maintain a good level, and prevent any deterioration in the quality of present and future enterprise of such description. It must be left to time to prove whether the work has been done wisely or too well.

THE REGISTRAR-GENERAL'S LAST QUARTERLY RETURN.

By J. HAMPDEN SHOVELLER.

THE quarterly return of marriages, births, and deaths in England and Wales has just been issued by the Registrar-General. The statistics relating to marriages are for the third or summer quarter of 1884, and those relating to births and deaths are for the three months ending December last. The marriage-rate showed a marked decline from that recorded in the corresponding period of the previous year; the birth-rate and the death-rate were below the average. The mean temperature at the Royal Observatory, Greenwich, was $44^{\circ}1$, and slightly exceeded the average for the corresponding periods of 112 years. The rainfall amounted to 4.57 inches, which was more than $2\frac{1}{2}$ inches below the average amount.

During the third quarter of 1884 the marriages of 100,550 persons were registered in England and Wales, equal to an annual rate of 14.7 per 1,000 of the population, estimated by the Registrar-General to be rather more than twenty-seven millions of persons. This marriage-rate was 0.8 below the rate recorded in the third quarter of 1883, and 0.6 below the average rate in the corresponding periods of the ten years 1874-83.

The births of 227,277 children were registered in England and Wales during the last quarter of 1884, equal to an annual rate of 33.2 per 1,000 of the estimated population. This birth-rate exceeded by 1.4 the rate in the corresponding quarter of the preceding year, but was below the mean rate in the fourth quarter of the ten years 1874-83. In the several counties the birth-rates ranged from 27.3 in Huntingdonshire, 27.5 in Rutlandshire, and 27.6 in Westmorland, to 37.4 in Nottinghamshire, 38.3 in Monmouthshire, and 38.4 in Durham. The 227,277 births registered in England and Wales during the last three months of 1884 exceeded the deaths by 90,047; this represents the *natural* increase of the population. From the Board of Trade returns it appears that 50,958 emigrants embarked during last quarter from the various ports of the United Kingdom at which emigration officers are stationed. Distributing those whose nationality was undistinguished, and excluding foreigners, the emigrants of British origin were 42,854, including 30,135 English, 3,804 Scotch, and 8,915 Irish. The proportions of British emigrants to a million of the respective populations of the three divisions of the United Kingdom were 1,111 from England, 984 from Scotland, and 1,800 from Ireland. Compared with recent corresponding quarters, the proportion of emigration last quarter showed a decline in each of the three divisions of the United Kingdom.

From returns published by the Local Government Board it appears that the average number of paupers relieved on the last day of each week in the

quarter ending December last was 700,587, of whom 181,776 received in-door and 518,811 out-door relief. The proportion of the population in receipt of pauper relief was 25.8 per 1,000, and showed a further decline from that recorded in the corresponding quarters of either of the two preceding years.

The deaths registered in England and Wales during the fourth quarter of 1884 were 137,230, corresponding to an annual rate of 20.1 per 1,000 of the estimated population. This death-rate, although 1.0 per 1,000 in excess of the rate in the last quarter of the preceding year, was below the mean rate in the corresponding quarters of the ten years 1874-83. In the various counties the death-rates ranged from 14.5 in Westmorland, 15.8 in Herefordshire, and 16.2 in the extra-metropolitan portion of Surrey and in Rutlandshire, to 21.8 in Nottinghamshire, 22.5 in the East Riding of Yorkshire, and 23.5 in Lancashire. In the principal urban districts, comprising the chief towns, and containing an estimated population of more than sixteen millions of persons, the death-rate last quarter averaged 21.7 per 1,000; in the remaining and chiefly rural population of about ten millions and three-quarters of persons, the rate of mortality did not exceed 17.6 per 1,000. These urban and rural rates were respectively 0.9 and 0.2 per 1,000 below the average rates in the ten preceding corresponding quarters.

In twenty-eight of the largest English towns, including London, and having an estimated population of more than eight millions and three-quarters of persons, the death-rate during the quarter under notice was equal to 21.7 per 1,000, and corresponded to the general urban rate. While the death-rate in London did not exceed 20.2, it averaged 22.9 per 1,000 in the twenty-seven provincial towns, among which it ranged from 17.8 in Portsmouth, 19.1 in Brighton, and 19.5 in Birkenhead, to 25.3 in Liverpool, 25.8 in Manchester, 26.5 in Cardiff, and 29.9 in Preston. The rates of mortality at different ages in these towns varied considerably. It may be noted that the death-rates among infants, measured by the proportion of deaths under one year of age to 1,000 births registered, ranged from 107 in Portsmouth to 213 in Bolton; that among persons aged between one and sixty years the rate of mortality did not exceed 10.0 in Brighton, whereas it was equal to 17.5 in Preston; and that among persons aged upwards of sixty years the death-rate ranged from 61.8 in Birkenhead to 111.0 in Blackburn.

The 137,230 deaths in England and Wales last quarter included 32,290 of infants under one year of age, 68,152 of children and adults aged between one and sixty years, and 36,788 of persons aged sixty years and upwards. Infant mortality was equal to 142 per 1,000 births, and was slightly below the average of the ten preceding corresponding quarters. In the twenty-eight great towns the proportion of infant mortality averaged 156 per 1,000 births; it did not exceed 136 in London, but averaged 172 in the twenty-seven provincial towns, among which it ranged from 107 in Portsmouth, 125 in Brighton, and 136 in Plymouth, to 199 in Leicester and in Cardiff, 206 in Preston, and 213 in Bolton. Among persons aged between one and sixty years the rate of mortality last quarter was below the average, while among elderly persons it showed an excess.

The deaths registered in England and Wales during the last quarter of 1884 included 3,203 which resulted from diarrhoea, 2,793 from measles, 2,540 from scarlet fever, 2,234 from 'fever' (including

typhus, enteric fever, simple and ill-defined forms of continued fever), 1,974 from whooping-cough, 1,475 from diphtheria, and 844 from small-pox; in all, 15,063 deaths were referred to these principal zymotic diseases, equal to an annual rate of 2.20 per 1,000, against an average rate of 2.78 in the ten preceding corresponding quarters. In the twenty-eight great towns this zymotic rate last quarter averaged 2.41 per 1,000, and ranged from 0.99 in Plymouth, and 1.09 in Brighton and in Portsmouth, to 4.00 in Bolton, 5.28 in Preston, and 6.54 in Cardiff. In fifty other considerable towns this zymotic death-rate averaged 2.68 per 1,000 and was higher than in the twenty-eight towns, while in the remaining or rural portion of the country it did not exceed 1.99 per 1,000.

Diarrhoea was by far the most fatal zymotic disease in England and Wales during the quarter ending December last, though the rate of mortality from this disease was slightly below the average. The 2,793 deaths referred to measles were equal to an annual rate of 0.41 per 1,000, which somewhat exceeded the average rate in the ten preceding December quarters. The highest rates from measles in the twenty-eight towns were recorded in Hull, Leicester, Bolton, and Cardiff. Among the fifty other towns the death-rate from this disease was proportionally highest in Warrington, Newport, and St. Helens. The 2,540 fatal cases of scarlet fever were equal to an annual rate of 0.37 per 1,000, which was less than half the average rate in the corresponding quarter of the ten preceding years. In the twenty-eight large towns the highest scarlet-fever rates were recorded in Cardiff, Sheffield, and Newcastle-upon-Tyne: among the fifty other towns the rates were excessive in York, Southport, Rotherham, and Ystradyfodwg. The death-

rate from 'fever,' which had averaged 0.45 in the fourth quarter of the ten years 1874-83, did not exceed 0.33 in the last three months of 1884. In the twenty-eight large towns the rate of mortality from fever averaged 0.34, but showed an excess in Salford, Leeds, and Derby. Among the fifty other large towns the highest fever death-rates were recorded in Ystradyfodwg, St. Helens, and York. The rate of mortality from whooping-cough was 0.29 per 1,000, and considerably below the average; among the large towns this disease showed fatal prevalence in Oldham, Leeds, Preston, Middlesbrough, Wigan, and South Shields. The death-rate from diphtheria considerably exceeded the average; the highest death-rates from this disease were returned in Cardiff, London, and Norwich. Of the 844 fatal cases of small-pox registered in England and Wales during last quarter, 676 belonged to greater London (including those of London residents recorded in hospitals situated outside Registration London), 10 to Birkenhead, 6 to Sunderland, 5 to Liverpool, 2 to Hull, and 2 to Cardiff, while 143 were registered in the rest of England and Wales.

The causes of 125,011, or 91.1 per cent. of the total deaths in England and Wales last quarter were certified by registered medical practitioners; and 7,200, or 5.2 per cent., by coroners in inquest cases. The causes of the remaining 5,019 or 3.7 per cent. were not certified; this proportion differed but slightly from those in recent quarters. The proportion of uncertified deaths in London was only 1.3 per cent., whereas in the rest of England and Wales it averaged 4.1. In the twenty-seven large provincial towns the proportion of uncertified deaths averaged 3.3 per cent., and showed the largest excess in Sheffield, Liverpool, Oldham, and Hull.

Analysis of the Vital and Mortal Statistics of the Twenty-eight Great Towns, dealt with in the Registrar-General's Weekly Returns, for the Fourth Quarter of 1884.

Towns.	Estimated Popu- lation middle of 1884.	Births.	Deaths.	Annual Rate per 1,000 Living.			Deaths from Principal Zymotic Diseases.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping-cough.	Fever.	Diarrhoea.	Rate per cent. of Uncertified Deaths.	Deaths of Children under one year of age
				Births.	Deaths.	Principal Zymotic Diseases.										
28 Towns	8,762,354	80,364	50,920	34.2	21.7	2.4	5,669	393	916	941	483	903	809	1,224	2.4	156
27 Towns	4,742,993	44,420	29,161	31.9	22.9	2.7	3,434	29	623	576	168	629	538	883	3.3	172
London	4,019,161	35,944	21,759	31.3	20.2	2.1	2,227	364	293	365	315	283	271	336	1.3	156
Brighton	112,954	896	579	28.7	19.1	1.1	33	1	1	9	5	2	8	7	1.6	125
Portsmouth	133,059	1,248	637	35.0	17.8	1.1	39	—	8	1	9	1	16	4	1.4	127
Norwich	90,410	800	550	33.0	22.7	2.1	51	—	—	2	9	17	16	7	2.0	121
Plymouth	75,569	61	412	32.2	20.5	1.0	22	—	—	1	2	2	8	7	0.7	136
Bristol	215,457	1,768	1,183	30.6	20.6	2.1	122	—	36	7	6	33	16	24	2.2	151
Wolverhampton	78,367	692	485	32.9	23.1	1.9	40	1	1	4	1	13	5	15	2.5	158
Birmingham	421,256	3,870	2,380	34.2	21.1	2.0	292	1	36	21	9	91	26	1.8	179	
Leicester	132,773	1,279	821	35.9	23.0	2.8	100	—	51	14	6	14	3	12	1.9	168
Nottingham	205,298	2,118	1,257	38.4	22.8	1.9	103	—	1	14	14	36	17	21	2.1	140
Derby	87,603	827	496	35.3	21.4	2.7	64	—	3	6	—	1	40	14	0.8	157
Birkenhead	90,872	921	475	37.8	19.5	1.6	38	10	7	3	1	—	9	8	4.0	157
Liverpool	573,209	5,367	3,891	34.9	23.3	3.0	404	5	122	82	41	62	41	111	5.7	153
Bolton	108,068	925	738	31.6	25.2	4.0	117	—	53	8	1	8	9	32	2.4	169
Manchester	338,295	3,228	2,341	31.6	25.8	2.1	192	—	13	26	8	35	39	71	2.7	156
Salford	197,151	1,892	1,181	35.8	22.3	3.1	166	—	6	37	7	29	38	49	4.7	156
Oldham	122,676	1,054	780	32.1	23.7	2.1	69	—	8	6	2	29	5	19	6.3	175
Blackburn	110,408	1,082	726	36.5	24.5	2.5	74	—	10	12	1	—	20	31	2.3	172
Preston	99,481	1,042	798	39.0	29.9	5.3	141	—	33	18	2	26	19	43	4.5	175
Huddersfield	86,004	698	469	30.2	20.3	1.1	26	—	9	1	—	3	5	8	3.4	175
Halifax	76,479	615	470	30.9	22.9	2.6	51	—	11	13	—	15	10	5	4.3	191
Bradford	209,564	1,661	1,199	29.5	21.3	2.4	136	—	23	19	5	38	11	40	1.9	161
Leeds	327,324	3,049	1,979	34.7	22.5	3.4	301	1	7	68	16	78	77	54	1.8	167
Sheffield	300,563	3,061	1,708	38.0	21.2	2.8	222	—	4	84	3	24	32	75	2.5	172
Hull	181,225	1,781	1,131	36.6	23.3	3.8	186	2	63	16	4	22	31	46	6.7	172
Sunderland	123,204	1,313	811	39.7	24.5	3.1	103	6	8	29	4	26	8	28	3.0	171
Newcastle-on-Tyne	151,325	1,554	994	38.3	24.5	3.1	125	—	6	50	5	11	20	33	2.5	171
Cardiff	93,468	1,077	665	42.9	26.5	6.5	104	2	97	25	7	4	9	20	8.5	207

THE SANITARY RECORD.

FEBRUARY 16, 1885.

Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers before the members of any sanitary or kindred association.

Authorities throughout the country confer a favour on the EDITOR of the SANITARY RECORD by forwarding to him all matters relative to Water-supply, Sanitation, and other matters generally, which come under his notice. He would also be glad to receive communications from Engineers of Waterworks, Sewerage, and Domestic Drainage Improvements, and comment, and illustration.

CUTTING OFF WATER SUPPLY FOR NONPAYMENT OF RATES.

In our last issue we called attention to the evil which might follow from the exercise of the power which water companies possess, of cutting off the supply where the rates they demand are not paid. We have since been favoured with a report by Dr. Orme Dudfield to the Kensington Sanitary Board with reference to the action of the Grand

Water Company in his district. This shows that at the time we wrote, the evils pointed out as probable were actually in place. Hayden's Mews, Notting Hill, is entirely occupied by Mr. Newman, an omnibulist, and he sublets the rooms over the shop to tenants of his own, who pay him weekly which cover the cost of their supply of water. Mr. Newman is the person to whom the company demand their water-rates. Owing to a dispute

Mr. Newman and his landlord, Mr. Newman, as to the proportion of the water-rate for the shop, properly chargeable on the part occupied by Mr. Newman, and possibly, also, in consequence of a sum charged for water-rate having grown suddenly, the water-rates demanded of Mr. Newman were not paid. The company exercised their legal powers, and on Dec. 15 cut off the water not only Mr. Newman's omnibus horses but also his tenants, in all, who had no share in the disputes. This came somehow to the knowledge of Dr. Dudfield, the Medical Officer of Health for the district. He brought them before the notice of the vestry and of the secretary of the water company. On December 18 the vestry sent a letter asking the company to receive a deputation on the subject, and also caused notices to be served on the occupiers in the mews requiring the occupiers to pay a proper supply of water. In the afternoon of the same day the company put up a standpipe in the mews, by means of which the inhabitants

were enabled to get some water for a short time every day. On January 6 orders to procure a proper supply of water, in accordance with the notices of the vestry, were duly made by justices, and compliance with those orders would infer the payment of all sums due to the water company, for on no other terms could the tenants get the communication pipes restored. Up to January 19 the water had not been laid on, and we do not know whether it has been done since. The supply from the standpipe has been all that the tenants have had since December 18—for the four days previously there was not even that—and this supply may be discontinued whenever the company get tired of giving it. Fifteen tenements inhabited by eighty-one persons, situated in a densely populated neighbourhood, are thus at present with a very insufficient water supply, and may at any time be deprived even of that, without any default on the part of the actual tenants. There is no doubt that such a state of things might easily be productive of a nuisance most dangerous to the health both of the inhabitants of the mews and of the neighbourhood generally. As we have repeatedly pointed out, the water companies are within their legal rights when they cut off the supply in such cases, and as they find that this is the readiest means of enforcing payment of the rates they demand, it is too much to expect them to sue for their money instead. In the present case, Dr. Dudfield fortunately became aware of the action of the company very soon after the water had been cut off, and (possibly in consequence of his prompt remonstrance) the company were kind enough to provide the stand-pipe, before any serious nuisance had been caused. But there is no security that this would always be the case. As Dr. Dudfield points out, water companies may cut off the supply because they are dissatisfied with the fittings in a house; but, if they do, they must give notice to the local authority of the district; when, however, they cut off the supply for non-payment of rates, they are under no obligation to give such a notice. The nuisance which may be caused is in both cases the same, and the local authority, whose duty it is to prevent and get rid of nuisances in the district, ought equally in either case to be apprised of the facts which are likely to cause the nuisance. As the action of the local authority in requiring a water supply to be provided is often a potent means of securing to the companies payment of the arrears of water rates, we should have thought they would have found it desirable to give an intimation to the local authority whenever the water supply is to be cut off from a house; but, as a fact, such notices are not usually given. While the law remains as it is, we must trust to the vigilance of medical officers of health and nuisance inspectors to protect their districts from unnecessary water famines, and hope that they may always be as successful as Dr. Dudfield seems to have been with reference to Hayden's Mews. When Parliament can spare time to attend to practical matters, we hope that the arbitrary powers, which purveyors of water now possess, will be curtailed; and that the right of cutting off the supply will be restricted to cases where payment of sums properly due cannot be enforced in any other way. It should not be possible, as it is now, to cut off the water as a means of enforcing a demand as to which there is a *bona fide* dispute. The powers at present possessed by the companies may no doubt be convenient to

them, but they are oppressive to that class of the community who can least help themselves, and are opposed to the sanitary welfare of every one.

PRIVATE BILL LEGISLATION.

FOR years we have been crying out in the wilderness for a reform in our present system of Private Bill legislation. The agitation was thought by some people to be fussy and ridiculous; by others to be academic and impracticable. Recent discussions in the House of Commons showed, however, that the leaven of reform was working, and it has now so far permeated the Parliamentary mind that two reviews of the first class devote this month a considerable portion of their space to a discussion of the question in all its bearings. So that we take fresh heart, and, having secured the aid of such powerful allies, may press forward to assured victory. We have, unfortunately, no space available for discussing at length the two papers, both in their way admirable, which appear in the current numbers of the *Edinburgh Review* and the *Nineteenth Century*. The pages devoted to the subject in our revered blue and yellow contemporary are, it must be confessed, a little heavy reading. The writer evidently escapes with difficulty from the dignity, solemnity, and, if we may so say, prosiness which would seem to be accepted ingredients in an *Edinburgh Review* article, though he relieves his soul by an occasional witticism of a somewhat sepulchral habit. Mr. Craig Sellar, in the *Nineteenth Century*, is brisker and more readable, though the trail of a second-reading speech is over his paper nevertheless.

Both articles run on very much the same lines: incompetency of a chance committee of four members of Parliament to decide questions of grave importance to the district concerned; hideously extravagant cost to promoters; uncertainty and inconsistency of decisions arrived at. And both make in effect the same recommendation, that the Houses should retain all the power which they at present possess over these Private Bills, but should delegate what is now the committee stage to judges. It is suggested that these judges should be on a level with ordinary Common Law judges, and should report to both Houses upon the evidence brought before them, stating whether the case was proved to their satisfaction or not, and giving reasons—which the present committees are careful not to do—for their decisions. Perhaps on balance this would be the best way out of the difficulty. But it is proper to observe that what such a judge would have to try would be not a question of law, but one of expediency. Is the legal mind quite attuned to this sort of work? Would there not be a danger of technical points upsetting a proposal that was otherwise unobjectionable?

For our own part, and so far as regards the sanitary schemes which inspire our chief interest in Private Bill legislation, we are strongly in favour of a generous extension of the system of provisional orders. The merits and demerits of a scheme are then examined on the spot by an expert, who gives every one a chance at a public inquiry of making known his objections; whilst Parliament still retains the power of rejecting or modifying the provisional order at any stage of the Bill in which it is enshrined. Railway Bills and

the like would probably require somewhat different treatment, into the details of which we cannot now go. But it is difficult to imagine any plan which could be more unsatisfactory and extravagant than the present system—if such a word can be applied to the chaos and jumble that are the characteristics of the Private Bill work of the Houses of Parliament. Mr. Craig Sellar's description in the *Nineteenth Century* of the life history of a Private Bill is excellently conceived and absolutely true. If we are asked to find fault with it, we should say that it was too soberly coloured. With Scotch caution, however, the young member for the Haddington burghs omits mention of the grosser absurdities and incongruities of the committee rooms, preferring, perhaps, to consider these as excrescences rather than as necessary parts of the system. But, even on his very temperate showing, Private Bill legislation, as at present practised, is a delusion and a snare, and must be reformed from the bottom without further delay.

NOTES OF THE MONTH.

WHITE-LEAD POISONING.

AN application was recently made to the magistrate at Worship Street by a man of middle age, who said he wished to know whether he could proceed against his late employer for damages under the following circumstances. He was employed at a white-lead manufactory in the district for four months, and at the end of that time he became so inoculated with the poisonous particles arising from the white-lead that he was unable to use his limbs, and was obliged to give up at once, and had done no work since. He would like to proceed for damages against the proprietor of the factory, because he had not taken the proper precautions to prevent injury to his *employés*. In the first place he had not secured the attendance of a doctor to visit and examine the workmen twice a week, as was the custom in all similar factories; and secondly, he had not provided the men with respirators to prevent poisonous matter from entering the throat. The magistrate referred to the sections of the Factory and Workshops Act affecting the case, and said that children were specially provided for as to their health and protection, but he could not find that the Act so protected grown men in factories where unhealthy trades were carried on. He was not himself empowered to grant any process, but he believed that if any complaint could be preferred against the employer at that court, or if damages could be obtained, the inspector under the Factories Act would be the person to prosecute. Truly 'a very pretty quarrel as it stands,' and an amicable settlement will probably be difficult to arrange, as the legal aspect is the least satisfactory of any in this respect, there being no direct or absolute legislation upon the subject. Mr. Lakeman, the senior metropolitan inspector, has stated that a short time since it seemed to be impossible to improve the system under which the white-lead was made, either in dispensing with the old stack method or in mitigating the consequences of handling the converted substance. The process is to subject pigs of lead to the action of acetic acid placed in earthenware pots arranged in rows in a large chamber called a stack, each row covered with tan; in this way layer after layer is laid,

until the stack, a floorless chamber, is full. The lead remains here for about three months, when carbonic acid gas is evolved, which escapes through ventilators in the chamber; during the evolution the lead 'grows,' i.e. fantastic crowns of white-lead, or carbonate of lead, are formed from the pigs. The removal of this white-lead to the washing-tanks, and from the grinding-pits to the stove-rooms where it is dried, and from there to the packing-room, are the three stages in the process which prove so injurious to women, who always do this work. Rules for cleanliness were laid down, but whether for want of strict supervision, or from carelessness of workers, no great advantage would seem to have accrued therefrom, for the evils, both external and internal, such as colic, palsy, paralysis, and death from absorption of the lead fumes, were not reduced, nor were any means found to be effective in abating them. No general rules were laid down or carried out, everything being left to the manufacturers, who, however, did provide necessities as to clothing and cleanliness for the good of male and female workers. Influence and persuasion were all that could be used to lead men up to the true intent and meaning of the sanitary clause, which contained no special reference to such trades as this; and manufacturers could not generally be said to pay sufficient attention to free the employment from the serious evils which carelessness and ignorance of the workers were sure to entail. Regulations were laid down by Mr. Redgrave enabling occupiers to frame rules which should render workpeople amenable to law from disobedience to them. The Factory Act of 1878 forbade anyone under 18 from working in white-lead works, as at this age it is evident ignorance and carelessness would certainly prevail. There is a system apparently little known, according to the inspector's words, called the 'Gardner process' of manufacture, in operation at Deptford, and which would appear to offer the very great advantage of securing perfect freedom from injury to health during the conversion of the lead to its ultimate stage of completion. This method of manufacturing white-lead is fully described in the SANITARY RECORD of Oct. 15, 1883, p. 224. The dubious state in which this industry is regarded by the law is summarised as follows. 'Therefore, under so rigid a system, first by legal restriction upon masters, and then by adherence to rules for workpeople, it is fair to assume that so deadly a trade may in the future be carried on under more healthy conditions, even if perfect immunity cannot be obtained.' There is, however, a want of completeness in the powers vested in the authorities, which calls imperatively for a clearer definition.

WORKSHOP SANITATION.

A BOOKBINDER of Queenhithe was summoned at the Guildhall for not having his workshop properly limewashed, and for employing three children under the age of fourteen without the requisite medical certificate as to their fitness. The defendant urged that it was purely an oversight; but the Lord Mayor imposed a penalty of 4*l.* and costs. Although the limewashing of factories has been enforced for over eighty years, even when more important sanitary considerations have been legislatively neglected, it was not until 1871 that workshops were included in the comprehensive measures at present in force, and it is now the duty of the Government inspectors, and

not that of the local authority, to assume jurisdiction over and draw no distinction between the large and small employers of handicraft. This, of course, is very necessary, as there are so many occupations carried on in what may be termed private workshops which compete with the extensive operations in specially designed buildings, and in which the evils complained of are erroneously supposed to be in proportion to the number of people employed. The reverse of this, however, is the truth, for, as a rule, the more important the building, the more perfect is the organisation, partly from business principles, and partly from the greater publicity which is given to the procedure, and the facility with which the place can be inspected. We have said that lime-washing has been of paramount importance in the eye of the law; but, according to recently published testimony, exemption in this respect was allowed to certain trades in 1867, and it was by the Act referred to, viz., 1871, 'that the wide sphere of usefulness was opened wherein all that was in violation of sanitary law in every place of industry in Great Britain was entrusted to H.M. inspectors of factories to remove;' and the good results of their active prosecution are constantly visible.

THE SEIZURE OF HORSEFLESH IN BIRMINGHAM.

IN the December number of the SANITARY RECORD the seizure of a large quantity of horseflesh on premises in Broad Street, Birmingham, occupied by a butcher, was reported. The inspector had watched the conveyance of a barrel and hamper containing the horseflesh from one of the railway stations to the shop, and had seized it and summoned the occupier of the premises for having in his possession meat unfit for human food. The case came before Mr. Kynnersley, the stipendiary magistrate, who declined to convict, on the grounds that the defendant had not opened the packages, and was not aware the meat was unfit for human food; nor had it been shown that he intended offering it for sale as such. This decision was appealed against by the market superintendent at the recent Birmingham Quarter Sessions, on the following grounds. 1. That the defendant was guilty of the offence. 2. That the dismissal of the information and complaint was contrary to evidence. 3. That the defendant did not prove that the meat was not in his possession, or that it was not intended for food of man. The appeal, it was stated, was taken under the 116th and 117th sections of the Public Health Act, which set forth that whenever any unfit article was found on premises, presumably for the food of man, the onus of proof that the article was not so intended rested on the persons charged. For the appellant it was stated that the respondent, Richard Pearson, carried on business as a butcher, and had for some time past been in the habit of receiving consignments of horseflesh, carefully packed, from Liverpool. On October 2 he received 3½ cwt., on the 9th 1½ cwt., and on the 18th 1½ cwt. The consignments were not in his own name, but in the name of Leeson, his son-in-law. On November 22, the date respecting which he had been summoned, he was seen by William Latham, inspector of nuisances, in the employ of the Corporation, to fetch a barrel and hamper from the railway station. The contents smelt very offensively, and shortly after they had been deposited in the respondent's shop, Latham called

there, had the packages opened, and found them to contain thirty-five pieces of horseflesh, salted and unsalted, in such a state of decomposition that they were condemned and destroyed. The meat was boned and cut up in pieces, as though for sausage manufacture, and it was suggested it would have been so used had the inspector not discovered it. On behalf of the respondent it was contended that there was no proof that Pearson knew what was the condition of the meat until it was exposed by Latham opening the packages. It was openly consigned as horseflesh, with regard to the eating of which there was a good deal of false sentiment existing; and had Pearson known it to be bad, it was scarcely likely he would have placed it in the shop within sight and reach of everyone entering it. The Recorder (Mr. J. T. Dugdale, Q.C.), in giving judgment, remarked upon the importance of the case to the public, also upon the fact that the respondent could not go into the witness-box to prove the article was not intended for human food, or for what purpose it had been consigned to him. The fact that there had been previous consignments did not carry the case much further, there being no proof that they were intended for human food. The case rested mainly upon the evidence of the witness Latham, 'who did not seem animated with very benevolent feelings in the matter,' and the respondent was not in a position to contradict him. Pearson had been a respectable tradesman at Bilston for a number of years, and had a clean record. There was no concealment of the meat, nor was any other meat of the kind found upon the premises. He (the Recorder) considered it obvious Pearson did not know the meat was unfit for food, and, in his opinion, when he discovered that to be the case it would have been destroyed. He therefore dismissed the appeal with costs.

In another case, however, in which a pork butcher and general dealer named William Hodges, carrying on business at 30 New Canal Street, was summoned before the Birmingham magistrates for having in his possession a quantity of pork and ten tins of potted pork unfit for human food, and in which the defence set up was that the meat was to be boiled for the pigs, a fine of 15*l.* was imposed.

EXPERIMENT WITH WATER SUPPLY FOR FIRE-EXTINGUISHING PURPOSES AT GLASGOW.

CAPTAIN WILLIAM PATERSON, of the Glasgow Fire Brigade; Mr. Langmuir, assistant to Mr. Gale; and Mr. William M'Onie, son of the Lord Provost, and others met recently in a district of the city which at present has the water supply regulated by one of Key's six-inch equilibrium pressure-reducing valves, described and figured in the *SANITARY RECORD* of Jan. 15, for the purpose of putting it to a test, and to see for themselves that which the inventor claims for his apparatus—namely, the facility that it affords for the instantaneous application of high pressure to the district required. The reducing valve was fixed on Dec. 25; since then it has continuously regulated the water supply of the district. The cover of the road-box has not been lifted since the valve was set, and there have been no complaints from the 2,100 inhabitants in the district as to their water supply. The pressure-registering gauge was attached to a fire-plug some distance from Key's valve. Mr. Paterson had a hose-pipe attached, and a detach-

ment of men, in case of an emergency, and on a signal by whistle a man proceeded to lift the road-box cover, and put on the full pressure. This was accomplished in the space of seven seconds from the sounding of the whistle. This proof of the adaptability of the valve for the reduction of pressure and facility for obtaining high pressure for fire-extinguishing was highly commended by all present. Mr. Paterson made further satisfactory experiments with his hose-pipes, the object being to test the capabilities of the valve to deliver large volumes suddenly withdrawn from the mains; this it did as if no valve had been there. The regulated pressure was found to be at 35 lbs. per square inch, and when the high pressure was let on the gauge indicated 53 lbs. per square inch. For some time before this invention was applied to the district the waterworks engineer had been taking a series of diagrams, by means of a waste-water meter, to ascertain the hourly delivery of water by day as well as by night, and since Key's equilibrium valve has been fixed these records have been continued; and although in many towns much higher pressures exist, and where a much lower standard could be fixed than in Glasgow, yet the results from the application of the apparatus to this district show as near as possible that there is a saving in the daytime deliveries of one-third of the water formerly used, and during night a saving of one-third of the water reckoned as leakage passing through the pipes in the small hours of the morning. Thus the day deliveries have been reduced from a rate of 49 gallons per head per day to 33 gallons, and the night leakage from 20 to 24 gallons per head per day to 15·3 gallons. In the Glasgow area of water supply there are 400 times the number of inhabitants that are in this district under trial; and allowing for high levels that do not need the pressures reduced, if one-fourth of the daily delivery of water was saved by the general adoption of this instrument, the water required would be 30 million gallons per day in place of 40 millions as at present, and 10 millions per day saved would, at trade rates, give a saving of water of the value of 60,833*l.* per annum.

OVERTIME IN FACTORIES.

STRINGENT as are the regulations of the Factory Acts, more particularly as affecting the helpless sections of the community, viz., the young persons and children, it is by no means uncommon to find that the regulations are sometimes evaded. It is, therefore, satisfactory to note that recently the transgressors have been reminded of their delinquencies. A firm in Moorfields were summoned at the Guild-hall for having employed hands for a longer time than permitted by the law. There were eleven summonses relating to women and young people so employed in a textile factory, at which, amongst other things, window-blinds for railway carriages were made. According to the Act, one of the conditions of their employment was that the hours should be from six in the morning to six in the evening, or from seven to seven. On the occasion referred to the employes were kept until within a few minutes of nine o'clock. The senior metropolitan inspector, however, thought it due to the defendants to say that they had thrown no obstacles in the way of his inquiry; but, at the same time, when they transgressed the Act, they must have done so knowingly, as the requirements of the Act

sted up in their office. It was stated on the defendants that they were desirous of within the spirit of the law, and they thought during the cold dark mornings the hands might be eight to eight, instead of from seven to put on one particular night, when they were to get some work finished, the hands continue work until nine o'clock. Under these circumstances the magistrate inflicted a fine of five pounds and costs in each case, amounting in all to five pounds.

Although it is highly necessary that even magistrates in this respect should be duly retrained, it must be borne in mind that there were strong temptations to the contrary, and the temptation to earn a small extra pay is at all times a strong inducement to both young and old; it is not to be wondered at that just one more often accepted rather readily than otherwise the majority; and this applies elsewhere as well. Owing to the way in which the laws are enforced, there is little danger of being carried to any extent; and the present offers a wonderful contrast to the good old times when George III. was king, when, owing to excessive hours of labour and the general incondition of the buildings, a marked physical deterioration of the employes was fast becoming

the first Factory Act was passed in 1802, for preservation of the health and morals of apprentices and others employed in cotton and other textile manufactures, and its intention, and even provision for the clothing of the apprentices; to have a new complete suit once at least a year. Attention was also enjoined to their condition, inasmuch as instruction in the tenets of the Christian religion was to be given to them four days at least, on every Sunday, by a specially appointed person. This Act, which is repealed, was not sufficient to cope with the evils attendant upon the increase and extension of manufacture, and in 1833 a second Act was passed for the regulation of 'the labour of and young persons (not apprentices) in textile manufactures and factories of the United Kingdom,' in which nightwork was abolished for those under twelve years of age, and they were not to work for more than twelve hours a day; children under nine were not to work at all, and those between eleven and sixteen were not to work for more than eight hours a day. During the next forty-one years eleven Acts were passed, dealing more or less with textile trades and more general restrictions upon operatives, and by this time the multiplicity of various regulations was such that it was necessary to appoint a Royal Commission to review the whole series, the result being that the Factory and Workshop Act, 1878, was passed, in which is included the sanitary provisions applicable to textile buildings, these latter provisions having been introduced from time to time as occasion required. The work has been done so effectually that there is now no opportunity for any serious evasion.

ARDENS AND THEIR OWNERS.

In this case, illustrative of privileges paid for enjoyment, has been brought to light by the City of London Public Garden, Boulevard, and Play Association. Lord Brabazon, on behalf of

the association, asked the Vestry of St. Pancras to acquire possession of and throw open to the public the small, well-kept enclosure in Camden Street, called Camden Garden, and offered, if it were desired, to appoint and maintain a caretaker for the first six months. Both the suggestion and the offer were refused. The Vestry Clerk stated that the ground was laid out some years ago by the Vestry with money obtained from the North London Railway Company in consideration of their being allowed to cross it; that it had since then been managed by a local committee and maintained by a rate levied upon the inhabitants of the neighbourhood, who have not the power of entering it. The ownership of many such London gardens is very doubtful. Bartholomew Square, a small enclosure in the crowded district of Old Street, E.C., is the property of the trustees of St. Bartholomew's Hospital, but is leased with a neighbouring public-house, whose tenant is supposed to keep the ground in good order. He has the right of using the garden, while the children of the narrow streets play on the stone-paved road outside. The publican does not appear to enjoy his privilege, for the ground is deserted, neglected, and untidy; and yet, strange to say, the trustees have refused to hand it over to a body willing to maintain it as a public garden.

THE BIRMINGHAM BOROUGH GAOL.

SPECIAL attention has been directed to the sanitary condition and other arrangements of the Birmingham Borough Gaol at Winson Green, in consequence of a report presented by the visiting justices and complaints made as to the 'unwise and inexpedient' provisions of the Prisons Act of 1877. Mr. Alderman Manton, J.P., chairman of the Visiting Committee, complained especially that without consultation with a magistrate or any official of the prison, the whole of the sanitary arrangements had been revolutionised, and in a most unfavourable manner. An experiment, as the committee were aware, had been made with regard to the closet accommodation in the basement cells. To his astonishment he found, on recently visiting the prison, that the whole of the closets in those cells had been ordered to be removed, and all connection with the outside sewerage to be severed. In lieu of the closets a small pan-bucket was provided for service at night, and in the morning those buckets (some 400 in number) had to be brought out of the cells, carried through the corridors, and emptied into twelve central closets. The stench arising from the process must be unbearable. During the day it was necessary for a prisoner to ring for the warder to let him out of the cell when he wanted to visit the closet. The alterations were not yet completed, and he suggested that the justices should make a strong protest against the closet system, which had been in vogue for some years, being superseded by one of so unpleasant and offensive a character. Complaints were also made as to the absence of any information as to the results of the administration of the prison affairs by the Prison Commissioners, whether the new system was cheaper or more expensive or more beneficial than the old one. One J.P. considered the Government were simply trifling with the magistrates, and that they ought not to submit to so unsatisfactory a condition of things without a strong protest. The Visiting Committee might as well be dissolved if they had

no voice or power in the administration of the prison affairs. A hope was expressed that the state of things with regard to the sanitary arrangements of the prison as described by Mr. Alderman Manton was not intended to be permanent, but that some better system was intended to be substituted than the old one of having the closets in the cells.

DEFECTIVE SEWERAGE ARRANGEMENTS AT MOSELEY.

IN consequence of the supposed death of a lady at Moseley, a residential district near Birmingham, through inhaling poisonous gases from the sewers, the attention of the sanitary authorities of the King's Norton Union has been directed to the whole question of the condition and arrangement of the sewerage system in that place. The medical officer (Mr. Hollinshead), at a recent meeting of the authority, attributed the death to other causes, but with reference to the sewerage question considered it a matter for consideration whether the ventilation was sufficient. A memorial was presented from a number of the residents calling attention to the 'pestilential gases' which escaped from the man-holes, to which a large amount of sickness was attributed, and suggesting an improvement in the flushing apparatus. The surveyor reported as to the levels of the sewers, and the difficulty there existed in the erection of ventilating shafts on private property, but said a ventilating shaft could be erected at a cost of 150*l.* at the junction of three roads, the sewers in which were most complained of, by which arrangement also three dead-ends would be abolished, and a number of openings might be closed. The authority have resolved to have a thorough and exhaustive examination of the drainage system of the district made by a skilled expert, with instructions to report what is necessary to be done to put the system into effective working order, both as to the running capacity and the ventilation, and have appointed a special committee to deal with the subject. The death-rate for the four weeks ending Jan. 24 was 23·95 per 1,000, which, though below the general death-rate, is nearly double what it was last year.

ADULTERATION.

IT is proverbially easy for a person who knows how to do it, 'to drive a coach and four through an Act of Parliament.' Those who read the newspapers know that the Adulteration Acts form no exception to this, but, on the contrary, that in many instances ways have been found of avoiding the intended stringency of their enactments. The last case which has come under our notice was one in which the Hampstead bench of magistrates had to consider a charge brought against a milkman of refusing to sell milk to an inspector who wanted to analyse it. The 'Sale of Food and Drugs Act 1875' by sect. 13 provides that 'any medical officer of health, inspector of nuisances, or inspector of weights and measures, or any inspector of a market, or police constable charged with the execution of the Act,' may procure any sample of food or drugs for the purpose of analysis. And sect. 17 of the same Act imposes a penalty of 10*l.* on the person exposing for sale any article of food or drug who refuses to sell it to such officers. The summons in question was taken out under the above section. It was proved

that the milkman was going round with milk to private houses, when the inspector applied to him for some of the milk and was refused. The defendant asserted, though according to the report the assertion was not supported by evidence, that the milk 'was being taken round in order to supply the customers under a contract, and consequently that it was not exposed for sale and he had committed no offence in not selling it to the inspector. He admitted that he had more milk with him than had been ordered, so as to be able to supply any customers who might want an extra quantity; and it seems difficult to understand how this extra quantity, at any rate, was not exposed for sale. The Bench, however, thought otherwise, and dismissed the summons. The decisions of one bench of magistrates are not binding on others, or even on themselves on subsequent occasions, and consequently the dismissal of this summons is of no great importance. It shows, however, a difficulty which may be met with whenever a sample of food is wanted for analysis and the suspected article is not in the shop. In the case of milk, the amending Act of 1879 gives power to 'procure at the place of delivery any sample of any milk in the course of delivery to the purchaser or consignee, in pursuance of any contract for its sale to such purchaser or consignee,' and imposes the penalty on the seller or consigner, or person entrusted by him with the charge of the milk, if he shall refuse to allow the sample to be taken. The summons in question should, in order to avoid difficulties, have been taken out under the latter Act instead of under the Act of 1875; and, if it had been, the defence which prevailed would not have been admissible. This section of the Act of 1879, however, applies only to milk, and it seems that a dealer in other articles of food which may be adulterated is practically safe as long as they are not found in his shop. What is there exposed for sale he must sell to the inspector who wants it for analysis; but if he keeps pure articles on his counter, and sends out others which are adulterated to his customers, the difficulty of proving a case against him will be greatly increased. Whether the milk in the Hampstead case was or was not exposed for sale, there can be no doubt that articles really in course of delivery are not so exposed. The decision in question is useful as calling attention to an omission in the Adulteration Acts which must interfere with their efficiency, and which can only be remedied by legislation.

PENNY DINNERS.

THE Central Council for promoting self-supporting penny dinners in London have recently issued circulars to the managers of all the elementary schools in the metropolis, both board and voluntary, urging an extension of the movement, the benefits of which are pointed out, and offering pecuniary assistance under certain conditions. Grants have already been sent to five dinner centres, and other applications are under consideration. The council will shortly publish a pamphlet containing suggestions for establishing and carrying on penny dinners, and also numerous dinner recipes. H. R. Williams, Esq., has joined the council as the nominee of the Ragged School Union, and Lord Colchester and F. S. Powell, Esq., have been nominated as representatives by the National Society. Miss Ewbank and W. M. Wilkinson, Esq., have also been added to the council.

THE PUBLIC HEALTH

DURING JANUARY 1885.

mean temperature during the month of January at the Royal Observatory, Greenwich, was $36^{\circ}6$; it slightly exceeded the average January temperature in one hundred out of any year since 1881. An excess of temperature occurred on nine days of the month, while on the other two days it was below the average. The warmest month was the 29th, when the mean was as $50^{\circ}1$, and $9^{\circ}9$ above the average; the coldest was the 31st, when the mean was only $28^{\circ}1$, and below the average. Rain was measured at Greenwich on fifteen days during the month, to the aggregate of 1.4 inches, which was half an inch below the January rainfall in sixty-one years, and was below the corresponding month of either of the preceding years. The sun was above the horizon 259.1 hours in January, but only 16.9 hours of sunshine were recorded at Greenwich; this amount was considerably below the average of the first month of the preceding years, though it slightly exceeded that of January 1884. The wind was very variable throughout the month.

The twenty-eight large English towns dealt with by the Registrar-General in his weekly return, which have a total population of nearly nine millions of persons, had 16,662 deaths were registered during the four weeks ending the 31st ult. The annual birth-rate, which had declined in the three preceding months from 33.7 per 1,000, rose again to 36.4 during January, exceeded by 1.5 the rate recorded in the corresponding month of 1884. In these twenty-eight towns the lowest rates last month were $28^{\circ}0$ in Brighton, and in 31.1 in Bradford, and 31.4 in Plymouth; in the towns the rates ranged upwards to $42^{\circ}3$ in Wolverhampton, $34^{\circ}5$ in Preston, and $48^{\circ}3$ in Cardiff. The rate in London last month was equal to $35^{\circ}8$ per 1,000, while it averaged $36^{\circ}8$ in the twenty-seven provincial

towns, had been $20^{\circ}5$, $21^{\circ}7$, and $22^{\circ}8$ per 1,000 in the preceding months, further rose to $24^{\circ}4$ during January. The rate considerably exceeded that recorded in the corresponding periods of the two preceding years 1883 and 1884, were $22^{\circ}7$ and $21^{\circ}0$ per 1,000 respectively. The rate of mortality last month in these towns was highest in Brighton and in Derby. The rates in the other towns ranged in order from the lowest, were as follow:— $0^{\circ}5$; Bradford, $21^{\circ}0$; Birkenhead, $21^{\circ}6$; Salford, $22^{\circ}1$; Leeds, $22^{\circ}4$; Nottingham, $23^{\circ}4$; Huddersfield, $23^{\circ}9$; Bolton, $24^{\circ}1$; Oldham, $24^{\circ}2$; Blackburn, $24^{\circ}6$; Portsmouth, $24^{\circ}6$; Halifax, $24^{\circ}6$; Sunderland, $25^{\circ}2$; Birmingham, $25^{\circ}6$; Leicester, $25^{\circ}8$; Wolverhampton, $26^{\circ}8$; Manchester, $28^{\circ}8$; Plymouth, $29^{\circ}3$; Southampton, $30^{\circ}5$; Norwich, $31^{\circ}2$; Preston, $31^{\circ}6$; the highest rate during the month, $36^{\circ}2$ in Cardiff. The death-rate in London, as above stated, was $24^{\circ}0$ per 1,000, it averaged $24^{\circ}8$ in the twenty-seven provincial towns.

The 16,662 deaths from all causes in the twenty-eight towns during the four weeks of January included 1,510 deaths which were referred to the principal zymotic diseases, of which 452 resulted from whooping-cough, 1,058 from measles, 213 from scarlet fever, 163 from small-pox, 46 from 'fever' (principally enteric), 143 from typhoid, and 180 from diarrhoea. These 1,510 deaths equal to 9.0 per cent. of the total deaths, and to an annual rate of $2^{\circ}21$ per 1,000. This zymotic rate was a slight further decline from those in recent years, and was below that recorded in the corresponding month of either of the two preceding years 1883-84, when $2^{\circ}4$ and $2^{\circ}6$ per 1,000 respectively. The zymotic rate in London during January was equal to $2^{\circ}1$ per 1,000; in the twenty-seven provincial towns it

averaged $2^{\circ}3$, and ranged from $0^{\circ}7$ in Brighton and in Birkenhead, and $0^{\circ}9$ in Oldham, to $3^{\circ}6$ in Preston and in Sunderland, $3^{\circ}9$ in Leicester, and $11^{\circ}2$ in Cardiff.

Whooping-cough was the most fatal zymotic disease in the twenty-eight towns during January. The rate of mortality from this disease in these towns, which had been $0^{\circ}30$, $0^{\circ}37$ and $0^{\circ}48$ per 1,000 in the three preceding months, further rose during January to $0^{\circ}66$, but was slightly below the rate recorded in the corresponding month of 1884. In London the death-rate from whooping-cough was $0^{\circ}60$ per 1,000, whereas in the twenty-seven provincial towns it averaged $0^{\circ}72$ per 1,000, and showed the highest proportional fatality in Bradford, Preston, and Birmingham. The death-rate from measles, which had increased in the last three months of 1884 from $0^{\circ}27$ to $0^{\circ}48$ per 1,000, declined to $0^{\circ}42$ in January; in London the mortality from this disease did not exceed $0^{\circ}25$ per 1,000, whereas it averaged $0^{\circ}57$ in the twenty-seven provincial towns, among which the highest rates were recorded in Newcastle-upon-Tyne, Sunderland, Leicester, and Cardiff. The rate of mortality from scarlet fever, which had been $0^{\circ}45$ and $0^{\circ}38$ per 1,000 in the two previous months, further declined to $0^{\circ}31$ in the month under notice. The scarlet fever death-rate in London was equal to $0^{\circ}24$ per 1,000, while among the twenty-seven provincial towns it averaged $0^{\circ}38$, and showed the highest proportional fatality in Leeds, Newcastle-upon-Tyne, and Halifax. The rate of mortality from 'fever,' which had declined from $0^{\circ}41$ to $0^{\circ}27$ per 1,000 in the last three months of 1884, further fell to $0^{\circ}21$ during January, the lowest rate recorded in any month since July 1881. The 'fever' death-rate in London was last month equal to $0^{\circ}16$ per 1,000, while it averaged $0^{\circ}26$ in the twenty-seven provincial towns, among which the highest rates were recorded in Newcastle-upon-Tyne, Sheffield, Derby, and Norwich. The mortality from diarrhoeal diseases was below the average for the corresponding period of recent years. The death-rate from diphtheria was equal to $0^{\circ}22$ per 1,000, and showed a slight decline from that recorded in the preceding month; the rate of mortality from this disease in London last month corresponded with that in the aggregate of the provincial towns. During the four weeks of January 163 fatal cases of small-pox were recorded in the twenty-eight towns; the fatality of this disease showed a slight decline from that in December. Of these 163 deaths, 143 occurred in London, 6 in Liverpool, 2 in Birmingham, 1 in Bolton, and 1 in Newcastle-upon-Tyne. Judged by the returns of the Metropolitan Asylum Hospitals, the prevalence of small-pox in London showed a further increase during January. The number of small-pox patients under treatment in these hospitals, which had been 536, 884, and 1,076 at the end of the three preceding months, further rose to 1,147 at the end of January. The average weekly number of new patients admitted to these hospitals, which had steadily increased from 73 to 217 in the four preceding months, further rose to 248 during January.

The rate of infant mortality in the twenty-eight towns, measured by the proportion of deaths under one year of age to births registered, was equal to 138 per 1,000 during January, against 136 in the corresponding periods of the two preceding years, 1883 and 1884. While the rate of infant mortality did not exceed 129 per 1,000 in London, it averaged 145 in the twenty-seven provincial towns, among which it ranged from 99 and 110 in Hull and Portsmouth, to 164 in Preston, 180 in Plymouth, 184 in Cardiff, and 227 in Huddersfield.

The death-rate from diseases of the respiratory organs, judged by the metropolitan returns, considerably exceeded the average during January. The weekly number of deaths referred to these diseases in London averaged 558, and the annual death-rate was equal to $7^{\circ}1$ per 1,000. In Liverpool the annual rate of mortality from these diseases was last month equal to $7^{\circ}7$ per 1,000.

The causes of 404 of the 16,662 deaths recorded in the twenty-eight towns during the four weeks of January

were not certified, either by registered medical practitioners or by coroners. These uncertified deaths were equal to 2·4 per cent. of the total deaths, which showed a slight decline from the proportion in recent months. In London the proportion of uncertified deaths did not exceed 1·5 per cent., while it averaged 3·2 in the twenty-seven provincial towns, ranging from 0·5 in Bristol and Bolton, and 0·6 in Plymouth, to 6·7 in Sheffield, 8·1 in Huddersfield, and 10·3 in Oldham.

Among the population living in the outer ring of suburban districts around London, estimated at rather more than 1,000,000 persons, the annual death-rate during January from all causes was equal to 20·7 per 1,000, against 16·5 and 17·1 in the corresponding periods of 1883 and 1884. During the four weeks ending the 31st ult., 94 fatal cases of small-pox, 36 of 'fever,' 27 of measles, 27 of diphtheria, 15 of 'fever,' 12 of scarlet fever, and 10 of diarrhoea, were recorded in the outer ring. These 221 deaths were equal to an annual rate of 2·6 per 1,000, which considerably exceeded that recorded in the corresponding month of either of the two preceding years. The fatality of scarlet fever and of 'fever' showed a marked decline, while that of diphtheria and of whooping-cough showed an increase. Of the 94 deaths from small-pox recorded in the outer ring during January, 78 occurred in West Ham district (including 19 of London residents registered in the Metropolitan Asylum Hospital at Plaistow), 7 in Edmonton, 7 in Croydon, 1 in Barking Town, and 1 in Hornsey. Of the 27 fatal cases of diphtheria, 5 were returned in Hornsey sub-district, and 3 in the sub-district of Willesden.

NOTIFICATION OF INFECTIOUS DISEASES.

THE table on page 363 contains uniform statistics relating to sickness and mortality in thirty-one of the thirty-nine urban sanitary districts of England and Scotland in which the notification of infectious diseases is compulsory. The population of the thirty-one towns for which we are enabled to publish complete statistics for the month of January is estimated at upwards of two-and-a-half millions of persons. The annual death-rate from all causes during the first month of this year in these thirty-one towns averaged 24·12 per 1,000 persons estimated to be living therein, showing a further increase upon the rates recorded in the three preceding months, which had been 20·51, 21·91, and 24·00 per 1,000 respectively. The rate of mortality in the twenty-eight towns dealt with by the Registrar-General in his weekly returns was 24·40 during January, and was, therefore, slightly above the rate in the thirty-one towns in the accompanying table. The death-rates last month were considerably below the average in Barrow-in-Furness, Burton-upon-Trent, Leek, Macclesfield, Reading, and Salford; while they showed an excess in Burnley, Dundee, Preston, Stalybridge, and Warrington. The death-rate from the eight infectious diseases dealt with in the table averaged 0·70 per 1,000, showing a slight further decline from the rates recorded in the three preceding months, which had been 0·98, 0·91, and 0·71 per 1,000 respectively. No death from any of these infectious diseases was recorded last month in Jarrow, Leek, Stalybridge, and Warrington; while in the other towns the rates ranged upwards to 1·11 in Reading, 1·14 in Bury, 1·29 in Preston, 1·65 in Rotherham, and 1·68 in Halifax. One death was referred to small-pox in Bolton; scarlet fever was proportionally most fatal in Halifax and Rotherham; enteric fever in Edinburgh, Bury, and Preston; and diphtheria in Portsmouth and Reading. Two deaths from typhus were recorded in Edinburgh, and 4 from puerperal fever in Manchester, 2 in Dundee, and 2 in Greenock. With regard to the notified cases of infectious disease in these thirty-one towns, it appears that the proportion of persons reported to be suffering from one or other of the

eight diseases specified in the table was 4·88 per 1,000, against 7·92, 6·71, and 5·24 in the three preceding months. While the proportion did not exceed 0·46 in Warrington, 1·16 in Stalybridge, 1·30 in Jarrow, and 1·56 in Macclesfield, it ranged upwards in the other towns to 5·55 in Reading, 6·04 in Leicester, 7·05 in Bradford, 10·53 in Edinburgh, and 14·13 in Barrow-in-Furness. The excessive rates recorded in all the last-mentioned towns were due to the epidemic prevalence of scarlet fever. Seven cases of small-pox were notified in Birkenhead during January, against 30 in each of the two preceding months; scarlet fever showed the greatest proportional prevalence in Halifax, Burnley, Bradford, Edinburgh, Leicester, and Barrow-in-Furness; enteric fever in Portsmouth, Greenock, Aberdeen, and Edinburgh; and diphtheria in Portsmouth, Reading, Dundee, and Barrow-in-Furness. Four more cases of puerperal fever were notified in Salford during last month (against 3 in each of the two previous months), 3 in Manchester, 2 in Dundee, and 2 in Greenock.

SPECIAL REPORTS.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

At a meeting of this society, held at 1 Adam Street, Adelphi, on January 16, 1885, Dr. T. O. Dudfield, president, in the chair, the Council presented a report recommending the adoption of a new code of by-laws of the society, which was approved after slight modification.

The Council deferred reporting upon other subjects referred to it.

Dr. B. A. Whitelegge, medical officer of health to the borough of Nottingham, was elected a member of the society.

Mr. William Eassie, C.E., was elected an associate of the society.

Papers, of which the following are abstracts, were read on the subject:—

ARE SMALL-POX HOSPITALS NECESSARILY (*per se*) A SOURCE OF DANGER TO THE SURROUNDING POPULATION?

By E. T. Wilson, M.D., physician to the Cheltenham General Hospital; J. W. Tripe, M.D., medical officer of health to Hackney; and E. Gwynn, M.D., medical officer of health to Hampstead.

Dr. Wilson stated that the occasional spread of small-pox in the immediate neighbourhood of small-pox hospitals in the metropolis seems to be an acknowledged fact. At the same time it is clear from Dr. Thorne Thorne's exhaustive inquiry that no such extension of the disease has ever been known to take place in even the largest provincial towns. How is a difference so remarkable to be explained? Are the ordinary channels of small-pox spread acting under the altered conditions of a dense population sufficient to account for the facts, or are we driven to seek for some altogether new factor peculiar, it may be, to the metropolitan area? The answer is important, as on it would seem to hang the very existence of isolation hospitals for small-pox in London, even in their present modified form. Those who hold that no new element has been introduced would point to the exceptional facilities which have existed up to a very recent period, perhaps exist even now, for the extension of small-pox around the isolation hospitals. Defects of site and of construction; ingoings and outgoing with but slight precautions; abuse of the ambulance system; convergence of friends upon the hospitals, and of patients who often walk through the streets; surroundings generally of the poorest; cases treated at home or concealed; these and other causes too numerous to mention are, it is maintained, sufficient to account for any undue spread of the

disease in the neighbourhood of small-pox hospitals. There are others, however, notably Mr. Power, Dr. Tripe, and Dr. Gwynn, who have felt themselves compelled to the conclusion that, whatever may be the case elsewhere in London, the infectious matter from small-pox hospitals is carried through the air for distances of a mile or a mile and a half. The evidence for this remarkable theory, first propounded by Mr. Power in 1881, rests on statistics chiefly, and on facts which certainly admit of more than one interpretation. Much stress is laid for instance on a graduated intensity in the number of houses invaded round small-pox hospitals, although in some cases the houses and population have been so varied in character as to render any comparison between districts useless; and in others the intensity has been shown to result from a convergence of disease, commencing at a distance, and not from any divergence springing from the hospital as a centre.

Such contradictions cannot but give rise to the suspicion that neither the atmosphere nor the numbers in hospital are concerned in the spread round these buildings, especially when it is found that the waves of intensity during an epidemic period are synchronous to a very remarkable extent around the various small-pox hospitals and in the metropolis as a whole; that, moreover, whole streets and buildings with susceptible individuals in the closest vicinity to small-pox hospitals often enjoy an immunity from the disease, quite unaccountable on any theory of distant aerial spread of the infection. The distribution of cases also, in both time and space, especially in Mr. Power's investigation, point to some causes acting continuously within the district rather than to any emanation from the hospital itself. On these grounds, and in view of the known causes of small-pox spread, giving rise to thirty or even fifty cases from a single one, it is contended that there is no need of a hypothetical aerial spread of infection to account for cases whose origin cannot be traced; and that a small-pox hospital *per se*, and independently of its intercourse with the neighbourhood, is not necessarily a source of danger to the surrounding population.

Dr. Edmund Gwynn read a paper dealing with the question—

COULD A SMALL-POX HOSPITAL, LIMITED TO THIRTY OR FORTY BEDS, BE MAINTAINED IN A CROWDED NEIGHBOURHOOD WITHOUT DANGER TO THE SURROUNDING INHABITANTS?

Abundant proof, he said, had already accumulated that in former epidemics small-pox had increased largely in the neighbourhood of great hospitals. In Hampstead, for instance, all houses lying between the hospital and Haverstock Hill in the epidemic of 1872 were attacked, and in the epidemic of 1877 there was a great concentration of disease in houses adjoining the hospital; but in the epidemic of 1881, when the hospital was closed, the houses and streets in the vicinity were almost entirely free from small-pox. The Hampstead Hospital was again opened for small-pox cases on April 6, 1884, the largest number of admissions in any week being forty-four, and in some weeks the numbers in hospital fell to seven and five. Three or four weeks after the opening of the hospital a large increase in the number of cases in Hampstead occurred. The houses near the hospital were not the first attacked, the chief outbreak being in the district of Belsize. These latter houses were distant from the hospital from one quarter to half a mile, and during the period they received their infection the wind blew steadily from the direction of the hospital on to them. After the first week in June the number of houses invaded within a quarter of a mile radius from the hospital continued to rise steadily, in proportion to the other houses in the parish, until at the end of eight months out of 310 houses in the special area 62 had been attacked, against 134 out of a total of 6,870 houses contained in all the parish.

In the experience of 1881, the special area containing

267 houses contributed only 4, against 36 in the parish. Thus, with the hospital open, the incidence in the special area had increased to 20·5 per cent. with the hospital closed. But an area round the workhouse showed only an increase over '57. The deaths from small-pox per 1,000 had risen from 2·1 in 1881 to 15·3 in the present year. The author asked, If the various explanations offered account for the spread of disease in the neighbourhood of the hospital by concealed cases, by overcrowding, by the natural march of the epidemic from east to west or to north, are to be accepted when the hospital was closed, why did the disease almost absent itself from the special quarter during a severe epidemic when the hospital was closed? The entrance to the hospital was on the west side, yet disease in former epidemics concentrated itself on the east side, where ambulances only removed cases by reason of a barrier erected in Fleet Road.

In the present case the barrier had been removed, the entrance was now in Fleet Road, yet the disease appeared on the west side. There appeared to be a spread of small-pox on the line of sewer above the hospital. The author believed the danger from the hospital to arise from its action being continuous, where outbreaks in other quarters could be effectually dealt with by disinfection and removal of cases.

Dr. Tripe began his paper by stating that he admitted that the infectious matter of small-pox could be carried at a distance, say of 20 yards, and this is allowed by the authorities, he cannot understand why under favourable circumstances it cannot infect at a greater distance, especially as no one assumes that the poison can be destroyed by the air in a few minutes. He then referred to the difficulty of ascertaining the precise source of infection in most cases, and therefore of assigning aerial infection as the means by which the disease is spread. That this is especially the case as regards the Homerton Hospital, the visitors and tradespeople going to the small-pox hospitals enter and come out by the same gate where the wards are much too near the street. Describing the position and the hospital as regards the streets and open country, he brought forward statistics to show that in all the epidemics since that of 1870, the inhabitants of the streets near the hospital had suffered more than those at a distance from it; that the high incidence diminished as the distance from the hospital increased, and that although other outbreaks nearly as severe from time to time occurred in other parts of the district, yet they had not occurred in every epidemic as was the case with the streets near the hospital. He specified the statistics of the 1883-84 epidemic in which the percentage of cases within the quarter-mile radius was 33·6, and of deaths 33·6, out of the total cases reported; deaths registered amongst the inhabitants. The statistics included all those occurring at Highgate, at the ships, and at Darenth. Between the quarter and half-mile radii the cases were 33·9 per cent., the deaths 35·2, and the houses 14·7 per cent. of the whole, making 56·8 per cent. of cases, 68·8 per cent. of deaths amongst the residents, and 20·8 per cent. of all the houses in the district. In the district between the half-mile and one-mile radii there were 17·6 per cent. of cases and 16·8 per cent. of deaths, and only 17·6 per cent. of cases and 14·5 per cent. of deaths amongst the inhabitants of the district (above one mile outside the mile radius). As regards the proposition that the disease is spread by aerial infection, he stated that in March 1884 an outbreak of 67 cases in 6 days occurred in a part of the district (to the south-west of the hospital), where there had not been but two cases a night before, and where it was, in his opinion, impossible that the disease could have been caused by the ordinary modes of infection. In this instance the disease veered three times all round the compass from S.W. to N.E. on each occasion for some time in a direction E.N.E. from the hospital. That there was almost a constant wind on two occasions, the wind blowing about 3 miles

hour; on the other occasion it had the low velocity of from 6 to 8 miles an hour. Also that the air was unusually moist for March. That outbreaks occurred all round the hospital on several occasions when the wind was nearly calm, and had blown from the hospital towards the infected places. He again expressed his belief, which he had stated when examined before the Royal Commission on hospitals for infectious diseases, that the infection may be carried over a high building, and gave what he considered to be reasonable proof of this assumption. A large number of maps and some tables and other statistics were given to support the various propositions.

The President, in thanking the readers of the papers in the name of the society, commented on the importance of the subject which was before the meeting, and invited a discussion on the influence of small-pox hospitals in the metropolis.

Dr. Gibbon thought that the theory of aerial transmission of infection is a fallacy, and that the special incidence of small-pox upon the quarter-mile radius round the hospital was likely to be due to traffic. It was a mere assumption that the poison is particulate. Since the special small-pox hospitals had been constructed, the mortality had been three times as great as in any previous epidemic; this he attributed to the transmission of persons suffering from small-pox through the streets.

Dr. Iliff was of opinion that no definite conclusion could yet be come to as to how the infection had been spread, or, indeed, as to the fact whether small-pox hospitals were a cause of as much disease as had been stated. There was no small-pox hospital in his district, but there had been local outbreaks which would have been attributed to a hospital had they been in its locality. He was surprised at the number of unvaccinated persons which had been found during a recent epidemic prevalence of small-pox in his district.

Dr. Pringle gave an account of his experience of small-pox in India, and of the difficulty he had had in combating the custom of inoculation. He thought the small-pox crust was well adapted for disseminating the poison by the air. He thought that patients in the convalescent stage were more likely to be a source of danger than in the acute.

The meeting was then adjourned.

At the adjourned meeting on January 26, Dr. Roberts, in opening the discussion, said that the hospital at Deptford until four or five years ago was surrounded by market gardens, but now houses were built upon them and small-pox was always prevalent there. During the year 1884 there had been forty-one cases in that portion of the quarter of a mile radius which was in his parish, there were twenty-seven within the mile, and seventy-eight in the district beyond the mile. Most of the houses were newly built and many of the servants of the hospital lived within them, but before they were built, the proprietor of a market garden had observed a fact that every person he put on to plough the land had small-pox.

Dr. Corner stated that from May 1881 to May 1882, the Plaistow hospital was made use of by the Poplar Board, and there were never more than twenty cases within it. From May 1884 this hospital had been used by the Metropolitan Asylums Board, and he was quite convinced that it was a centre for the spread of infection.

The President said he had invited medical officers of health acting in districts which had small-pox hospitals in or near them to favour the Society with their experience of small-pox prevalence. He could speak with regard to the Fulham Hospital. The disease was prevalent in the parish long before the hospital was opened, but it increased considerably for a short time immediately after the hospital was opened, for in two weeks 26 cases occurred in South Kensington, 22 cases being infected in five days; 4 in the central circle; 5, 3, and 3 in the three outer rings; and 7 outside the special area. Altogether, during 1884, 177 cases of small-pox were recorded, 76 in the north, and 101 in the south. He did not know

the population of the Kensington part of the special area, but no doubt the cases had been relatively more numerous in the special area than in the remainder of South Kensington; especially would this be true in regard to the inner circle, if percentages of houses newly invaded were taken after Mr. Power's method. The Fulham Hospital was opened on May 17, so that any influence it might have had on the special area would not come into operation until the end of May. Prior to June 1 there had been 23 cases of small-pox in Kensington, of which two were in the special area; in the remainder of the year, the hospital being opened, there were 154 cases, of which 58 were in the special area.

Dr. Bridges expressed the opinion that the evidence adduced before the Royal Commission showed that small-pox hospitals have inflicted an appreciable damage upon their immediate neighbourhoods, but it was difficult to say whether the benefit afforded by them was not a sufficient compensation. He thought Dr. Tripe's figures very accurate, and that they showed that the quarter-mile radius had suffered excessively, and at Homerton more so than at Stockwell or Hampstead. There was a good deal of evidence pointing to the conclusion that the present system was much more satisfactory than the former. He had a table showing the admissions into the hospitals of the Asylums Board from July to December 1884, from the different districts. Of these there were ten which were contiguous to small-pox hospitals; of these, five sent more than the average, and five sent less. Hampstead sent as many as St. George's-in-the-East, and it was interesting that although the area round the Hampstead Hospital was affected in 1871 it was enormously less so than in 1884. That alone was enough to make them doubt whether the spread can possibly be connected with the existence of the 25 cases. He was not prepared to accept Mr. Power's opinion as to how small-pox was spread.

Dr. Squire fully agreed with Dr. Wilson as to the way in which small-pox spread. After discussing the nature of the poison, he expressed his disapproval of the manner in which persons suffering from small-pox were now conveyed from place to place in the metropolis.

Mr. Shirley Murphy pointed out that the distribution of cases in St. Pancras, the northern district of the parish, which had on its borders two small-pox hospitals, had during the earlier part of last year suffered much more severely than any other part, but during December small-pox had very considerably increased in the southern part of the parish.

Dr. Butterfield had not yet formed an opinion whether the dissemination of the disease was aerial. The Bradford Hospital was occasionally used for small-pox, but in only one instance did the disease spread to other wards, and then it was conveyed by the nurse. His experience led him to think that small-pox did not go up the chimney, out of the window, or jump over the walls, but it went through the gates.

Dr. Wilson said Cheltenham was perhaps the worst town in England in which to study the mode of spread of small-pox; a few cases were imported, but the disease never spread beyond the house where it was first known. He thought the discussion had rather wandered. The question was whether by the careful management of small-pox hospitals, by the control of the ambulance arrangements, small-pox hospitals might be made harmless. Mr. Power's report was reasonable from the premises laid down, but he did not think the premises were correct. In the case cited by Dr. Tripe they found an extraordinary exception in the City of London Workhouse, where the infection passed over the inmates in a most marvellous manner. The question of conveyance by wind was one worthy of inquiry; he was inclined to think, from certain buildings having been exempt, that the theory of aerial dissemination of small-pox could not yet be accepted.

The society then adjourned until February 9, when the subject will be further discussed.

YORKSHIRE ASSOCIATION OF MEDICAL OFFICERS OF HEALTH.

ANNUAL MEETING AT YORK.

ON the 27th ult. the annual meeting of the Yorkshire Association of the Medical Officers of Health was held in the Council Chamber of the Guildhall, York. Mr. S. W. North, of York, occupied the chair, and there were also present Dr. Riddings, Calverley; Dr. Hime, Bradford; Dr. J. M. Wilson, Doncaster; Dr. Burman, Wath; Dr. Bruce Low, Helmsley; Dr. Deville, Harrogate; Dr. Muir, Kirbymoorside; Mr. H. E. Spencer, York; Mr. H. C. Shann, York; and Mr. Joseph Wilkinson, the Town Clerk of York. Dr. Wilson, hon. secretary, read the following

REPORT OF THE COMMITTEE FOR THE YEAR 1884.

The Association has now completed its ninth year. It is undoubtedly advancing in usefulness and importance. The number of members is fifty-six, an increase of two since last year. The Association has lost two members by death—Dr. Taylerson, of Whitby, and Dr. Muscroft, of Pontefract. Three members have resigned on vacating their appointments. There have been three meetings during the year. The first was held at Leeds in March, when G. Goldie, Esq. (Leeds), read a paper on 'Our Epidemic Diseases, and how they are Spread,' which provoked a lively discussion. Dr. Giddings then gave 'An Account of the Sanitary Work done at Calverley during the last Ten Years.' The second meeting was held at Halifax in May, in conjunction with the North-Western Association of Medical Officers of Health. Dr. Britton introduced the subject of 'The Working of the Factory and Workshops Act (Retail Bakehouses), 1883, in rural and semi-rural districts.' A very interesting discussion followed, in which Mr. Walton, Town Clerk of Halifax, took part. Dr. Hime (Bradford) then gave an address on 'Poisoning by Coal Gas.' Dr. Vacher (Birkenhead) read a paper on the 'The Dress of Women and Children,' illustrated by diagrams and specimens of clothing approved by the National Dress Association. Dr. Kenyon (Chester) introduced a discussion on 'Water Analysis,' in which several of the members took part. The third meeting was at Hull in October, where, after paying several interesting visits, the Mayor (Alderman Rollit, D.C.L., LL.D.) entertained the members at luncheon in the Town Hall. The papers were read by Dr. Mason (Hull) on 'The Sanitary History of Hull,' and by Dr. Bruce Low (Helmsley) on 'Rural Sanitation.' Considering the value and importance of many of the discussions, it is to be regretted that so few of the members avail themselves of the opportunities which these meetings afford of mutual instruction and encouragement in the vital principles of public health and sanitary science. There are many members who are never seen at these meetings, although every endeavour is made to suit their convenience by fixing the place of meeting in various localities from time to time in succession. Will not those apathetic members make an effort to attend at least one meeting in the year to show their interest in the Association and their approval of its aims? A good work is undoubtedly being done in encouraging the medical officers of health in their difficult duties. The Association, too, through the press is doing a great work in guiding and developing public opinion on the great health topics of the day. The office-bearers of the Association look to the members to support them in their efforts for the general good. A far larger number might contribute papers than do so at present. 'The willing horses are doing all the work.' Besides attendance at meetings and the reading of papers the apathetic members should remember their small annual subscription (5s., due Jan. 1), which the treasurer complains is collected with difficulty. The secretary will be glad to receive promises of papers for the coming year; and will also be glad to receive the names of any Yorkshire medical officers of health who have not as yet joined the

Association. The committee regret that no one was given during the ordinary session of Parliament year to present the memorial on the need for the out of the Dairies and Milk-shops Orders being to the sanitary authorities. The experience of outbreaks of disease, coincident with milk strengthens the arguments which can be offered of this change. The supervision of bakehouse again transferred to the sanitary authorities, and ing out of the Canal Boats Act has been extended few sanitary authorities first selected as authorities to every sanitary authority whose dis upon any navigable water. It may finally be granted that these changes, all imposing greater bility upon medical officers of health as the adv sanitary authorities, are evidence of greater cor the principles of local government, and also of of local officers as custodians of the public health

ELECTION OF OFFICERS.

The following gentlemen were elected the off Association for the ensuing year:—President, 1 North (York), re-elected; vice-presidents, (Bradford), Dr. W. S. Giddings. Comm Arbuckle (Thorne), Dr. T. Britton (Halifax Goldie (Leeds), Dr. Hardcastle, F.R.C.S. (R Mr. A. Roberts (Keighley), and Dr. Mason (H secretary, Dr. Wilson (Doncaster); and treasur Bruce Low (Helmsley). Dr. Honeyburne, of elected a member of the Association.

THE PRESIDENT'S ADDRESS.

The President then said that it became his for the eighth or ninth time to thank the meml Association for the honour they had done him in him to the position of president. Looking back somewhat lengthened period, he could say that things in which he had taken an active interest him more sincere gratification than the formati society. He believed that the institution of the tion had done much to encourage a spirit of f and kindness amongst the various medical officer throughout that great county, which would othe been scarcely possible. He thought, further, tha ciation had done a great deal to encourage and spirit of mutual confidence and respect betwe authorities and their officers, thereby doing gre the cause of sanitary science. Again, eminent had resulted from the reports of the Association' in the public press, and on behalf of the Asso returned grateful thanks to the various newsp had given reports of their proceedings. Having reasonable excuse for the meagre attendanc meeting—viz., this being the busy season of th medical officers of health—he said that there we two matters which he thought that Associati fairly consider. The first and foremost was that which a memorial was already prepared and wa forwarded to the Legislature—viz., legislation w to the sale of milk. During the past ten years been accumulating an overwhelming amount of e show that serious outbreaks of typhoid fever we over again traceable to the sale of infected mi seemed to him somewhat marvellous that the Legi not seen its way clear to adopt some measure by sale of milk might be placed under more immedi tant control. The number of lives which had been the amount of time which had been lost, and t that had been created by the unmistakable ow typhoid fever arising from infected milk were st those who had taken the trouble to compare the that Association aimed at was that legislation o ject, which was very meagre at present, should entirely on the same lines as the Public Health administration of all the regulations in regard shops and dairies should be taken from the bas

police, as it now existed in the counties, and placed under the sanitary authorities of each district; and the supervision of those places should be primarily placed in charge of the medical officers of health of the respective districts. They were of opinion that visitation and inspection of the premises by the sanitary authorities should be allowed, and that all milk-sellers throughout the length and breadth of the land should be licensed, one condition of the licence being the satisfactory condition of the premises where they kept food. There was another subject which excited much attention. It was the question of over-pressure in education. He took a very wide view of the functions of medical officers of health, and he thought it was incumbent upon them that they should inform themselves what were the facts of that question. A great deal was written that was evidently absurd, and a great deal said that was obviously and grossly misleading. There had been a want of logical separation of what was due to social conditions and to education, and he was of opinion that no body of men probably were better fitted to guide the public on that question than officers of health, because it was given to them to know more particularly about the conditions of health of the people in all parts of the town or district in which they exercised their functions. They ought to be able to inform School Boards and local educational authorities what were the stricts in which poverty, misery, and bad health prevailed, and to what extent it should influence the action of schools. They ought to educate public opinion to understand how much of that trouble was the result of disease and misery and poverty, and how much, if any—which he thought was an open question—was due to our educational system. He thought they would then contribute greatly to promote that which every right-minded man desired, *viz.*, that there should be full and careful study of the education of the people combined with a minute and careful study of the physical health conditions of the people. It could be demonstrated that physical health was sacrificed by education, it would be an open question whether they had not better forego education and maintain physical health; but if it was, as he was very strongly persuaded, that education had nothing to do with the impaired physical health of the people, it would be their duty to point out to the people what those other and extraneous causes of that impaired health were, in order that legislation might provide remedies which were compatible with the welfare of the State. There was another topic which he believed would become in the near future more important than it was at present, *viz.*, legislation as to the hospital care and treatment of infectious diseases. He was perfectly satisfied that if sanitary work was to be done thoroughly it must be more or less in accordance with the general knowledge and sentiments of the medical profession, and he believed that any great advance in provisions for the health of the public, taken apart from the opinions and views of the medical profession, would be almost certain to end in failure. He believed that the better treatment of infectious diseases, and the prevention of epidemics, was essentially a medical question, and one which should not be adopted by any officer of health apart from the combined expression of the medical opinion of the neighbourhood in which he lived. He thought that medical officers of health should not allow that important question to grow without having made up their minds as to what was the right course to pursue in order that those hospitals might be brought into harmony with the medical profession at large. He believed all other methods and efforts to stem infectious disease and prevent epidemics were absolutely useless unless they were coupled with the provision of larger hospital accommodation, into which all classes of the community might be willing to seek admission.

THE GERM THEORY OF DISEASE.

Dr. Hime read a paper on 'The Germ Theory of Disease.' He said that his paper was intended to show the basis of belief for what is known as the germ theory of

disease, to trace out the leading events in the history of the theory, and to show the position in which it stands at the present time as a scientific theory fully verified by facts. It was about two hundred years since Robert Boyle first referred to fermentation as being the process strictly analogous to fever; and the same belief had become permanent amongst us, as indicated by the use of the word *zymotic* as applied to fevers, which really meant fermentative diseases. In more modern times Henle had, entirely on theoretical grounds, established the theory of germ disease before anything was known of the actual existence of germs; but it was to Pasteur and Koch that the theory was indebted for its present scientific aspect. It was not a little remarkable that Pasteur's early work had nothing whatever to do with disease. It was entirely concerned with fermentation proper, and it was he who first proved that what we know as ordinary fermentation was a process which was distinctly the outcome of the vitality and energy of the yeast plant, and not (as was taught by Liebig) a result of the development of the yeast plant. One remarkable characteristic of ferments was the great disproportion between the results which it was capable of producing when placed in a suitable medium and the exceedingly small quantity of material which could produce those results. It might be compared to the multiplication of infectious material, such as vaccine, when inoculated on the body. In further studies Pasteur ascertained that while some ferments required air to enable them to live and flourish, others were killed by its action. Hence he divided all ferments into two great classes—those which did not require air, or *anaerobes*, and those which did require air, *aerobes*. Subsequent investigations into another process—the idea of which even was disgusting, *viz.*, putrefaction—convinced Pasteur that it, like ordinary fermentations, was due to a specific ferment, which did not require air for its development, and which alone produced the phenomena of putrefaction: a process strictly analogous to fermentation, the two differing only in one circumstance—that in putrefaction offensive smelling gases were given off. The important bearing of putrefaction upon the organic matter of the world was illimitable, the ultimate fate of all animal and vegetable matter being the same—*viz.*, its restoration to the air, effected by the three omnipotent processes of fermentation, putrefaction, and slow combustion. The first great work which Pasteur was engaged in was the state of the wine disease, the remedy of which he discovered as well as the cause. He was next engaged in the investigation of the silkworm disease. Next Pasteur was engaged on the state of the disease affecting vinegar and beer, and this also he proved to be due to a specific minute fungus. When this was excluded the liquor remained unaffected. The central point of investigation—the application of the germ theory to the higher animals—was then mentioned, and the strict analogy between the process of fermentation and certain kinds of disease (such as fevers) was described. It was, however, in surgical practice that the truth of the germ theory first bore its fruits, and to England, in the person of Sir Joseph Lister, was due the glory of having established a method of surgical practice which had not only rendered familiar operations free from danger, but had rendered possible operations which, a few years ago, it would have been considered criminal to attempt. What was known as the antiseptic system of surgery was practised by the leading surgeons in every country in the world, and Sir Joseph Lister was recognised throughout the civilised world as one of the greatest benefactors of humanity. The first actual disease of animals to which Pasteur devoted his attention was anthrax, or malignant pustule. In 1850 it was discovered that the blood of animals affected with disease contained a number of little hair-like bodies, but it was not until some thirteen years later Dr. Davaine, in the light of Pasteur's researches, bethought him that possibly these little bodies might be ferments which caused disease. He discovered by numerous experiments

that these little germs were inseparably connected with the disease, and the following remarkable sequence of facts established the necessary connection between the germ and the disease. In the first place, these minute bodies were found in the blood of infected animals, but never in healthy blood. In the next place, the inoculation of healthy animals with these minute bodies caused the unaffected animals to become affected with the same disease, and the blood to swarm with identically minute germs. Thirdly, blood taken from the infected animals after infection, but before the appearance of these minute bodies, and inoculated on healthy animals, failed to produce disease. Fourthly, healthy blood inoculated on healthy animals never produced disease. Fifthly, blood might be disinfected or even filtered and thus freed from the germs, and then when inoculated would be quite harmless. The method which Pasteur devised, and experimentally tested, was simply beautiful and conclusive. The essayist then described the 'flask experiment.' Pasteur also discovered that it was possible by proper methods of culture to deprive infectious germs of a portion of their virulence, and that in their debilitated condition they may be propagated from generation to generation, and reproduce themselves. He further learnt that these attenuated or weakened bacilli might be inoculated upon an animal, giving it a mild form of disease, which, however, would protect it from contracting a disease in its most severe form. The protective inoculation against anthrax was not, unfortunately, permanent. Pasteur's researches into chicken cholera and various other diseases were referred to, and the remarkable induction by which Pasteur obtained an attenuated protective virus by which this disease could be avoided, was also alluded to. The greatest experiment which Pasteur ever performed was that to test the efficacy of his protective virus on anthrax, and this experiment was lucidly detailed. In conclusion, Dr. Hime said that the bearing of that important theory upon public health was of very wide extent, and opened up to them an horizon, the extent of which exceeded anything ever dreamt of. If they really had ascertained the specific cause of consumption, anthrax, pneumonia, diphtheria, typhoid fever, and a number of other of the greatest plagues of humanity, more than the first step had been taken towards successfully combating those diseases. But they could not hope for rapid progress in this country while they were hampered by measures which entirely prevented the possibility of scientific research, and which, while it rendered perfectly legal the killing of rats and other vermin with the wanton intention of merely getting rid of them, rendered it a penal crime to inoculate a rat or a mouse with the object of saving human life.

In a short discussion which followed, Dr. Low alluded to the large contributions of Germany to the discussion of the germ theory as compared with that given by England. This he attributed to the circumstance that in England the Government suppressed science so far as it could by its legal enactments. He described the instruction the German Government afforded to country practitioners on the question of epidemic diseases, and he considered that at the recent Health Exhibition the English Government might have given similar facilities. Mr. H. E. Spencer dealt with the question of the germ theory in its bearing on the doctrine of evolution. In concluding his remarks he said that it did seem singular that they should find such a considerable amount of failure on the part of other observers to produce the results attained by Pasteur. Dr. Deville spoke of the investigations of Dr. William Budd, of Bristol, who was one of the first to experiment on the germ theory, and commended his researches to consideration nowadays. The President said that, if further research should confirm the germ theory of infectious disease the power placed in the hands of those who had to deal with the prevention of disease would be scarcely credible. He thought that that theory, taken side by side with Pettenkoffer's views with regard to the

nature of the soil, might and probably did afford a rational explanation of localised outbreaks of typhoid fever, &c. In conclusion, he condemned that fanaticism which would deny scientific investigation which, by a few experiments, might save the lives of thousands of their fellow-men. Dr. Hime having replied, the meeting closed with an inspection of several microscopic specimens of the germs of various diseases exhibited by the writer of the paper.

BIRMINGHAM AND MIDLAND ASSOCIATION OF MEDICAL OFFICERS OF HEALTH.

THE tenth annual meeting of the Birmingham and Midland Association of Medical Officers of Health was held at the Council House, Birmingham, on Jan. 8. There were present Dr. Clark (Lichfield), Dr. Alfred Hill (Birmingham), Dr. Bostock Hill (Birmingham), Dr. Page (Redditch), Mr. C. Perks (Burton-on-Trent), and Mr. Henry May (Birmingham). Mr. Perks was appointed president for the ensuing year in the place of Dr. Strange (of Worcester), the retiring president, to whom a vote of thanks was passed. Drs. Page and Bostock Hill were elected vice-presidents for the ensuing year; and the hon. secretary, Mr. Henry May, was re-elected. The annual report, which was adopted, stated that there had been no change of importance during the past year. The number of members had decreased, owing partly to resignations and partly to deaths, Dr. Hickinbotham, Dr. Rodin, and Mr. Darwin having died since the issue of the last report. Mr. Perks then read a paper on 'Sanitation,' which will be published in the *SANITARY RECORD* of March 15.

THE NATIONAL HEALTH SOCIETY.

THE annual general meeting of the society was held at 44 Berners Street on Feb. 3. Mr. Ernest Hart presided, and there was a large attendance of members. Additions were made to the lists of patronesses and vice-presidents, and Sir Joseph Fayrer and Sir Spencer Wells were elected upon the council. Valuable suggestions were brought forward as to the way in which the efforts of the society could be directed during the coming year, and the chairman urged upon the members the importance of making its useful work known to their friends so as to secure new subscribers, increased funds being much needed. The annual report, with the balance-sheet, was laid before the members, who were pleased to learn that the stall allotted to the National Health Society, for the sale of its publications, at the International Health Exhibition had been very successful,—an average of no less than 1,500 pamphlets and leaflets having been sold weekly. The meeting closed with votes of thanks to the chairman and officers of the society, including Mr. Richard Eve, barrister-at-law, solicitor, who had kindly procured the Act of Incorporation.

THE WATER SUPPLY OF LINCOLN.

OUR contemporaries, the *Lincolnshire Chronicle* and the *Lincoln Gazette*, have furnished us with the following facts connected with the water supply of Lincoln.

On Nov. 18 last, two samples of the drinking water supplied to Lincoln were sent to Dr. A. Dupré for analysis. He reported that the water was a 'second-rate drinking water,' and showed 'strong indications of pollution by sewage or surface drainage.'

Professor Wanklyn next analysed the water and described it as a 'second-class water,' 'fairly pure, but cannot be said to be excellent.'

Dr. C. Harrison says: 'Although this water contains an excess of organic matter, making it only a second-class water, I am of opinion there are no strong indications of "pollution by sewage," as stated in Dr. Dupré's report.'

Mr. Fisher is of opinion that the water 'is entirely satisfactory in quality for a town supply.'

It may be as well to mention that in essential particulars

the results obtained by the four analysts are fairly concordant, so that the discrepancy lies only in the conclusions drawn from them.

In a letter to Precentor Venables, of Lincoln, which was published by that gentleman in the *Lincolnshire Chronicle* for Dec. 12, 1884, Dr. Dupré complains that Dr. Harrison misquotes his conclusion. Dr. Dupré stated that the water showed indications of pollution by sewage or surface drainage, and, as he very truly states, it is rarely possible to decide by analysis alone from which of these two sources the polluting matter comes. 'This can only be decided,' he continues, 'by careful inspection;' and to these words we would draw the attention of the Waterworks Committee and Corporation of Lincoln.

Dr. Harrison agrees with Dr. Dupré that the water contains an 'excess of organic matter.' This organic matter must have a source. Chemical analysis has shown that, unless a natural water is unduly fed with organic matter, the quantity found in solution in water does not exceed a very small amount, the normal limits of which are fairly well defined and recognised. If the quantity of organic matter exceeds this normal limit, we examine as to its nature, whether it be vegetable or animal. There are certain distinctions between the two which are well known to chemists. Dr. Dupré satisfied himself that the organic matter in the Lincoln water was of animal origin; and he was therefore justified in expressing the opinion which he did as to its pollution by sewage or surface drainage. Chemistry having indicated the existence of the excess of organic matter over normal amounts, the nature of the organic matter, animal or vegetable, and in very rare cases the source of the animal organic matter—*e.g.* where there is large contamination with sewage, has done all in its power. Armed with the information obtained from the chemist, the sanitary engineer should complete the work by the 'careful inspection' mentioned by Dr. Dupré. The whole course of the stream, watercourse, or conveying-pipes, through which the water passes, should be carefully inspected with special reference to the discovery of the source of contamination indicated by the chemical analysis. Any sewage contamination in particular must be immediately arrested, and the water deemed unfit for drinking as long as it exists. This cannot be too strongly insisted on. The water draining off manured land must also be viewed with suspicion, but of course it is the existence of human excreta in drinking water which must be more particularly condemned, owing to the great risk there is that such organic matter may contain germs of infectious disease.

Perhaps, therefore, it may be a little too soon to attempt to 'calm the fears of the most timid,' and to show that 'there is no ground for the "scare" attempted to be raised'; it will be a grateful task to do that after the careful inspection has been made, and when the absence of polluting agencies has been proved.

Meanwhile, we may be certain that the population of Lincoln will be less injured by a little wholesome agitation of the mental kind than by an epidemic of typhoid or dysentery, which we hope they will not experience; and the final expenditure of public money will be far less if the drinking water is purified than if some insidious source of contamination is allowed to continue and perhaps increase until it becomes productive of serious results upon the public health.

THE TYPHOID EPIDEMIC AT KIDDERMINSTER.

THE report of Dr. Parsons, the Local Government Board inspector, who was deputed to investigate the causes of the widespread and alarming epidemic of enteric fever which wrought such havoc in the town of Kidderminster from the beginning of August till about the end of November last, has just been issued, and was brought before the consideration of the Town Council there on the 4th inst. It is a lengthy document, and, though not satisfactorily

accounting for the outbreak, contains a number of recommendations calculated to remedy various evils and defects in the sanitary system and water supply of the town, and to prevent a recurrence of a similar calamity. The report points out that from August 1 to August 15 there were 20 cases of fever. During the next fortnight there were 141, in 110 households. At the time of his visit to the town, in October, the number had increased to 620, and up to November 14 reached a total of 1,200; the number of deaths from August 25 to that date having been 89. One curious fact is that women suffered in greater proportion than men, out of 1,106 cases in which the sex of the patients was recorded there being 627 females to 479 males. The epidemic was from the first generally distributed over the whole of the borough, and no noteworthy difference was observable in the prevalence of the fever where there were water-closets or where midden-prives were in use. From the sudden and general character of the outbreak it was evident that the cause must be sought in some condition or association of conditions, in the first place common to the whole town, and secondly, coming into operation about the beginning of August. As to the probable causes, Dr. Parsons puts on one side the milk supply, and, although stating that 'no words of condemnation can be too strong for the system of midden-prives in Kidderminster,' says that does not explain the sudden outbreak. There was no doubt, he says, that both the sewers and house-drains throughout the town were seriously defective; some of the manholes had bottoms below the invert of the sewer, and thus retained putrefying sediments; large quantities of heated liquids from the factories ran into the sewers, raising the temperature of the sewage, promoting decomposition, and increasing the tension of the air; no provision was made for preventing the forcible ascent of air from the main sewer to the branches on higher levels; the flushing had been defective during the previous dry summer, and the sewers were of comparatively small size, and not water-tight. But these defects, together with those in the house-drains, had previously existed, and typhoid excreta had passed through them without causing an outbreak. Dr. Parsons next deals with the water supply, and criticises at length the surroundings of the supply obtained from what is known as the lower well, near the sewage-pumping station, which was so much talked about at the time, and was fully described in the *SANITARY RECORD*. After considering the possibilities—1st, of a contamination of the water supply at its source; secondly, of local contamination through reflux of foul matter into the terminal branches, Dr. Parsons cites a number of circumstances which favour the former hypothesis, such as the universal distribution of the fever over the area supplied from the Kidderminster mains, the dangerous proximity of the lower well to the sewage works, the large incidence of the fever upon water drinkers, and indications of the impurity of the water on certain occasions. The heated state of the sewage, with deficient access of air, would lead to a close imitation of the conditions under which the contagium multiplies in the human intestine. If, therefore, at the time when enteric excreta were entering the sewers, any portion of the sewage had got into the water supply, the danger might have been as great as if the sewage had actually come from a fever patient. While obviously inclining to the cause of the outbreak being traceable to contamination of the water supply of the town, Dr. Parsons comes to the ultimate conclusion that the cause of the outbreak cannot with certainty be assigned.

It is a somewhat interesting feature to note that at the sewage farm, which lies outside the borough boundary, not a single case of fever occurred among the persons subject to the influence of the effluvia therefrom, although the excreta of the typhoid patients was there treated—a striking proof of the deodorising and purifying power of earth. Dr. Parsons then makes a number of practical recommendations for the prevention of future outbreaks.

The Town Council also had before them a report from Mr. E. Pritchard, C.E., and Mr. Comber, the borough surveyor, as to the works necessary to be carried out. They propose sinking a new well, providing machinery to raise 1,250 gallons per minute, and a covered reservoir to hold 1,500,000 gallons, also to institute various alterations of the sewerage system; the total cost being estimated at 25,000*l*. It was resolved to hold a special meeting of the Council for the consideration of the whole subject.

BUILDING MATERIAL AND MANUFACTURERS' EXHIBITION AT LEEDS.

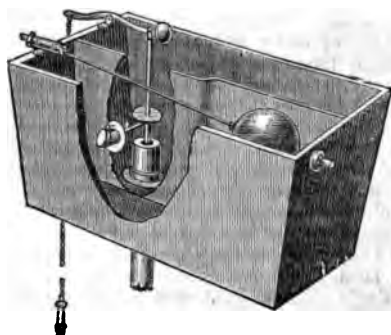
DURING the past month an exhibition has been held in the Coloured Cloth Hall, Leeds, of a similar character to the Building Exhibitions annually held at the Agricultural Hall, Islington. Mr. Philip Shrapnel, of Agricultural Hall, was secretary and manager of the Exhibition, and carried it out in the most satisfactory manner. The Exhibition was the largest and best yet promoted by private enterprise in the provinces; the exhibits were of a varied character, but the good largely preponderated, and, if a large number of them presented no new features, they were none the less interesting to the inhabitants of the large district of which Leeds is the centre.

Messrs. Doulton & Co., Lambeth, had a good representative exhibit of all their newest specialities, and of their celebrated Doulton ware, all of which were explained in detail in our WEEKLY EXHIBITION RECORD. It is now an acknowledged fact that Messrs. Doulton's sanitary appliances are amongst the best and those most to be relied upon manufactured at the present time.

Moule's Earth-closet Company were present with an excellent assortment of their famed earth-closets, with models showing arrangements for fixing, and a model showing an upstairs earth-closet and the easy manner by which it can be attended to from the ground floor. They also exhibited the model shown by them at the International Health Exhibition (where they obtained a gold medal), illustrating the manner in which a range of earth-closets can be set up for a school or large establishment.

Mr. Heaps, of Greenheys, Manchester, exhibited through his local agent the earth-closets that have so long and successfully been manufactured by him, and which have been described in the SANITARY RECORD on previous occasions. They are in large and increasing demand, and have received high commendation.

Mr. Henry Wainwright, Alfred Street, Boar Lane, Leeds, exhibited two new water-waste preventing cisterns recently patented by him. One of them is on the syphon principle, fixed in a wood cistern lined with lead. It has two compartments, one for ball-cock, the other to regulate the supply by the syphon. This is charged by means of a cylinder in which a plunger works, and that being



pressed down forces the water into the charging pipe against a foot valve (which then closes), and so into the pipe over the side of the cistern. This syphon differs

from many others, in so far that the discharge pipe is carried to the outside of the cistern, and there are no openings below the water-mark for water to escape. From the opportunity afforded to the writer of testing it, it appeared unerring in its action and simple in construction, and it is claimed that this water-waste preventer can be produced at a lower price than any syphon action in the market. The other (which we illustrate) is on the double valve principle, and has also two compartments. It is made of wood lined with lead, a mode that seems to find favour in Yorkshire. It is a water-waste preventer in the strict sense of the term. When the handle is pulled, the main valve in the larger compartment, which is of the ordinary kind, of course opens and discharges the regulation quantity of water, but at the same time the valve in the smaller compartment closes, and remains so as long as the handle is held; and as this is the one in which the water first enters to refill, no further quantity can be discharged until it is again full. It likewise prevents another form of waste. It appears to be a common practice in the northern parts of the kingdom, where the cold is more severe, and frosts of more frequent occurrence, for householders to slightly open the valve of the closet water-cistern at night to allow a small stream of water to run continuously, so as to prevent the contents of the pipes freezing. In Mr. Wainwright's cistern this is prevented, for, as we have remarked, when the discharge valve is opened the smaller or side one is in the other compartment closes, and so arrests the supply. Water companies will, no doubt, appreciate Mr. Wainwright's efforts to prevent this waste of their commodity. This is a cistern that may be introduced with advantage into the London market.

Messrs. Hodgkinson & Clarke, Limited, Canada Works, Small Heath, Birmingham, made an extensive display of their specialities. A prominent feature was the collection of school furniture, which has been fully described in the columns of the SANITARY RECORD. To say that this firm have introduced many commendable features into scholastic appliances is the smallest testimony that can be borne to their enterprise. They have also given the means of furnishing the school-room with cheerful and comparatively inexpensive adjuncts, alike pleasing to pupil and teacher.

Messrs. Illingworth, Ingham, & Co., of Leeds, also exhibited some very good school furniture, and a commendable collection of joinery work, of which they are extensive manufacturers. This collection included a variety of machine-made wood mouldings, wood-turnery, and Swedish doors.

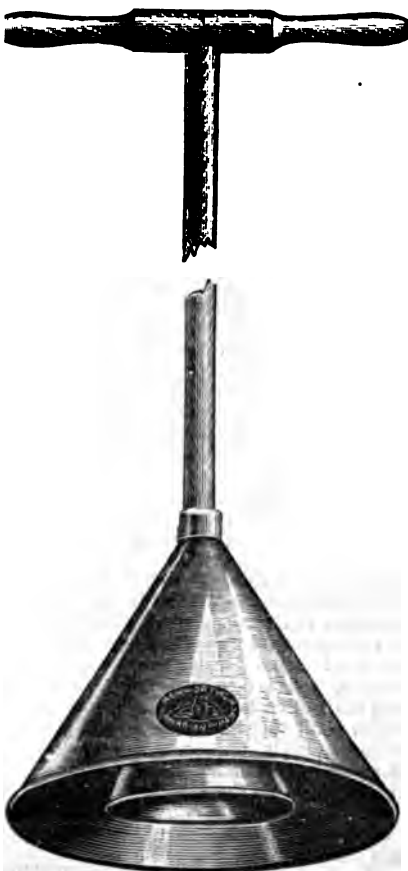
Washing and laundry appliances were exhibited by Messrs. Bradford & Co., of Manchester and London, and comprised the principal inventions which have rendered their name so popular.

Messrs. Kenworthy & Co., Alpha Works, Oldham, were well represented by their noted Paragon Washing Machines, which have secured a large amount of popular favour. Illustrations of this machine, with a somewhat recent addition of a patent automatic plunger, are appended. It works up and down in the tub, and is without doubt a valuable addition to the cleansing process. At the International Health Exhibition a silver medal was awarded to this machine, being the highest award granted to any special hand-power washing machine. The plunger in question is made to perform the work of the well-known 'Dolly' or 'Peggy', which is in almost universal use in the Midland and Northern counties, and which was in existence long before washing machinery was introduced. By turning the hand-wheel, which actuates the plunger it is moved upwards and downwards in the washer about sixty times per minute. It is constructed of several cones, one inside the other, having air spaces between each. In working, these spaces inclose a volume of compressed air, acting as a cushion, and spherically forcing the water and soap through the clothes, which rapidly loosens the grease and dirt, and removes it

injury to the most delicate fabric. The plunger has a spring, so that, should a larger quantity of linen be put in the machine than could conveniently be



at one time, the spring yields, preventing damage to the machine or contents. The Paragon Machine, mounted on castors, can be fitted either with a wringer or a mangle attached to the top. The Canadian Washer,



the utensil shown by the firm, partakes of the character of the plunger above described, as used with the

Paragon Washer; but, as will be seen by the illustration, is intended to be used entirely by hand, and with the deep round tub in general use in the north by those who do not possess a washing machine. The description given of the plunger in the Paragon Machine applies equally to the Canadian Washer, which amounts to a larger example of the same appliance. It is made either of tin or copper, and of the former material can be sold retail at 3s. 6d. Although it has not been very long introduced, it is said by the makers that over 100,000 of these washers have already been sold. The plunger is bound to take the place of the old-fashioned 'Dolly,' not on account of its cheapness only, but by the ease and marvellous amount of work it accomplishes when compared with the old type it is intended to supersede. Londoners and residents in the southern and western part of the kingdom are not much acquainted with the mode of washing generally adopted in the north, but so much interest was taken in this appliance when shown at the International Health Exhibition (where a large number were sold) that this system of washing will probably be extensively adopted amongst householders not hitherto acquainted with its advantages.

Messrs. C. Kite & Co., Chalton Street, London, N.W., while exhibiting their general system of ventilation for both buildings, drains, &c., showed some artistic designs in the form of brackets, small cabinets, &c.; while being useful for the purposes indicated by their form, were made to act as inlet ventilators, on the plan introduced by Messrs. Kite, for admitting fresh air into rooms. Their exhaust chimney-breast ventilator, which acts without making any unpleasant noise, and has received high commendation and awards, was a prominent article in the display.

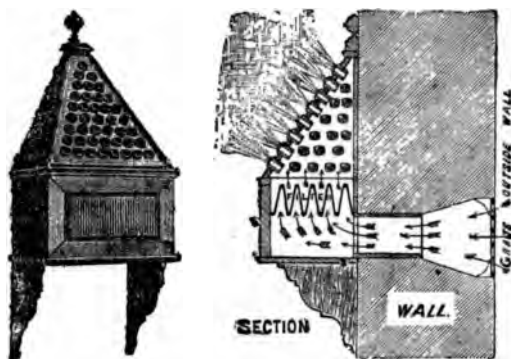
Mr. James Edward Ellison, Victoria Square, Leeds, made an imposing display of his ventilating appliances, all of which have been described in these columns on several occasions. Amongst his improvements we may, however, mention one in connection with his ventilating tubes for the admission of fresh air into apartments, which are now made with expanding tops, that have the effect of spreading the air over an extended area, and so preventing draught. The principle on which these tubes are constructed is the same as that of his patent conical ventilators, of which an immense number have been fixed, and that have gained him not only a gold but silver and bronze medals and numerous certificates. The exhibit also comprised a variety of glass, louver, and other ventilators, fanlight openers, &c. Mr. Ellison's abilities as a ventilating engineer are well known and appreciated by a large number of architects, under whose specifications he has carried out a large number of important works.

Messrs. Verity Brothers, Call Lane, Leeds, who have from time to time introduced many commendable inventions in connection with windows, fanlight-openers, &c., exhibited a new reversible sash window for enabling sashes to be reversed, so that they can be cleaned from the inside, and for opening them at any angle, &c. Although not the first invention of the kind introduced by this firm, it is of a more solid and durable character, combined with simplicity of action, than has come under the cognisance of the reporter. The most important part in the reversible system is the pivot on which the sash revolves, and it is the only one on which a doubt as to the safety of the invention has occurred to him, for, should one of the pivots break, the sash would in all probability fall into the street, to the imminent danger of life. In their new sash, Messrs. Verity Brothers have evidently been impressed with this idea, for it is made of exceptional strength, and is carried further into the sides of the framework than in others we have seen, and will, we believe, entirely satisfy the critical examination of any architect. A new window blind action of an inexpensive character was also shown, that may be termed simplicity itself, and for which we anticipate a wide demand.

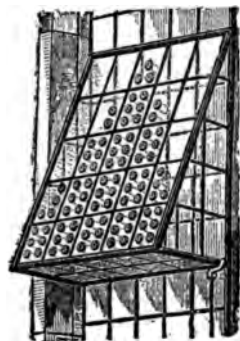
Mr. R. Adams, of Great Dover Street, London, S.E.,

made a somewhat similar display to that we are accustomed to see of his varied specialities in connection with windows, doors, locks, &c. A new heavy door spring hinge was exhibited named the Victor, intended to resist heavy winds in exposed positions, this end being accomplished by simply reversing the springs, of which there are two of unequal strengths, to opposite positions. The removal of the springs is effected by turning the set screws with the ordinary screw driver, or spanner, and can be done without removing the door. An improved mode of fixing the simple mechanism to his fanlight opener was also shown, which is now made to simply screw on to the framework, instead of having to be let in as heretofore.

In connection with ventilation an exhibit of considerable interest was that of the Harding Ventilator Company, East Parade, Leeds, of which some illustrations are appended. For the past four or five years the Harding mode of ventilation has been extensively adopted in the Midland and Northern counties for all kinds of buildings, including schools, churches, factories, private dwellings, &c. The proprietors, however, do not appear to have made any permanent arrangements for its introduction into the metropolis, where its advent should be appreciated. The inlet ventilators are framed upon a somewhat different principle to any other, and have the advantage, now considered almost indispensable in all ventilating appliances,



of being adaptable to different kinds of ornamental structures, where the actual use may be virtually concealed, and the mode of introducing fresh air be utilised for holding pottery, statuettes, or other ornaments. The first illustration represents in section and elevation an ordinary inlet ventilator without the additions above named, but which is the basis as regards the arrangements on which all are constructed. It will be seen that it consists of a lower box surmounted with a conical or semi-pyramidal structure. This is fixed against the wall, communicating



with the outer atmosphere, a grating being fixed over the opening. The air entering first passes through a filter formed of frames covered with a very fine silk gauze, such as is used in milling machinery for sifting the finest flour, and which is capable of arresting the very small particles

of dirt and soot with which the air of most towns is laden. It then rises and passes into the room through the apertures shown, which, it will be observed, taper off to a single one at the top. These apertures are not merely holes on the face of the ventilator, but are tubes of a certain length, and in passing through these the air is naturally compressed, but expands as it is set free, and the currents are, so to speak, broken up and diffused in all directions, so that no draught or chilly sensation can be felt. The 'air diffuser' is placed about 7 feet 6 inches from the ground, and the tubes stand at an angle of about 30° with the wall. Our next illustration represents a design for ventilating a church by means of the window. It will be seen that the pyramidal form of inlet, which is the ruling feature in the Harding system, is here maintained, and the tubes in this case are of glass. The air enters from an opening at the bottom from the window, and in all cases a valve is attached to regulate the admission of the air. In connection with church ventilation, Messrs. Harding have—by orders of the Dean of York—applied their system to Archbishop Zouche's Chapel in York Minster, and for this a special design was made. The work has proved so successful that the firm have received a most complimentary letter from the dean. As regards exhausts, for ordinary rooms a suitable one is made by the firm, or they do not object to any well-known one of other makers being used; but for carrying off the vitiated air from large buildings, or wherever it is collected in a dwelling-house into a main shaft, their Patent Air Extractor is recommended. This is of the fixed order, and is perhaps the cheapest of its kind. Our illustration depicts the elevation, and the interior contains the tube shown at the bottom carried to a certain height, where it is capped with a cone, open of course around the sides. In use, the air impinging upon



the outer cones becomes deflected, creating an induced upward current in the tube; and the small inner cone acts as a deterrent to the admission of rain, snow, &c., which we are assured cannot possibly enter. The extractors can be placed within an ornamental turret of any style of architecture, which does not affect their action. The Harding mode of ventilation possesses considerable merits and deserves all that has been said in its favour by those who have adopted it.

Messrs. Billington Brothers, Hope Street, Liverpool, were present with an assortment of their Patent Metallic Spring Mattresses for hospital and domestic use. These have been fully described in the *SANITARY RECORD* on previous occasions.

Mr. J. A. Somerset, St. Nicholas Buildings, Newcastle-upon-Tyne, exhibited a mode of ventilating rooms and buildings (Connell's patent). In one of the arrange-

ments double windows are utilised, the space between the two receiving the fresh air from the outside and admitting it into the apartment through a kind of fanlight-valve. Means of warming the air in cold weather by a jet of gas are also provided. The same plan was also shown by means of a ventilating tube built in the wall, and by others fixed on the wall of the room itself; but as on a future occasion the system will be fully illustrated in the *SANITARY RECORD*, a detailed account is reserved for that occasion. Specimens of dormer windows called the 'Combination' were also shown, which contained notable improvements. Description of these, also, is deferred until illustrations of them are laid before our readers.

Messrs. H. Thompson & Co., Merrow Street, Walworth Road, S.E., had an attractive display of their Magnetic Iron Oxide Paint, especially adapted for damp walls. As a proof of its worth for this particular purpose, it was the only damp wall paint to which was awarded a gold medal at the late Health Exhibition. These paints are also well suited for coating iron in exposed situations, possessing good body, and drying quickly. A notable example of the value of this paint for damp walls was shown by a course of damp brick-work covered with it, demonstrating the inability of water or damp to penetrate through it.

Mr. James B. Petter, of Yeovil, drew considerable attention, as usual, to his popular Nautilus Grate, which was originally noticed and illustrated in connection with the Smoke Abatement Exhibition. It unquestionably maintains its pre-eminence as the most unique open fire-grate of the day.

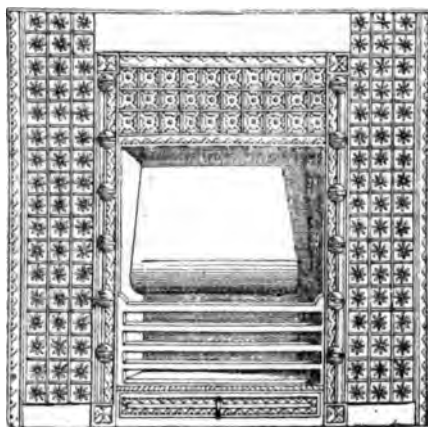
Messrs. James Nelson & Sons, Briggate, Leeds, made an imposing display of Grates, Mantelpieces, and other furniture connected with the fireplace. A notable feature in the exhibit were the patent fuel economising and smoke consuming grates, manufactured by the firm upon the principle advocated by Mr. Pridgin Teale, of Leeds, whose exertions in this direction are worthy of all praise. The grate in question was described in our issue of Feb. 15, 1884, but the importance of the questions involved justify a repetition of that description. The grate, as this illustration shows, is an open one. The whole of the fire basket, with the exception of the front bars, is of fire-clay of solid pro-

and, amongst the recent orders received by the firm, was one from Prof. Tyndall, F.R.S., who has had his house entirely fitted with this form of grate. Great heat, with a small consumption of fuel, are its leading characteristics.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

'Something attempted, something done.'

BACUP.—The fatal prevalence of typhoid fever here in 1883 is naturally a subject to which Mr. J. Brown, in his annual report, draws prominent attention. For the most part the cases were first brought to notice by the Registrar's returns, so that the information came too late for any useful preventive measures to be taken. In almost every house in which the disease appeared there were sanitary defects, the most common being untrapped slop-stones and drains. Indeed, as a rule, the health officer found the slop-stone pipe connected directly with the drain, which practically ventilated into the house. Mr. Brown animadverted upon this deplorable state of things, and recommends that all slop-stone pipes should be effectually disconnected, a recommendation which the authority now properly insist upon being carried out in all new buildings. Eleven out of the 26 deaths referred to zymotic causes were attributed to infantile diarrhoea, and occurred principally in delicate and badly-fed infants. Whooping-cough, which prevailed with short intermissions during the whole of the year, destroyed the lives of five children. From all causes the deaths numbered 452, being equivalent to an annual death-rate of 17.72 per 1,000 of population, the lowest registered in the district since 1877. During the year many houses were connected with the main sewer, and a number of privies on the old midden and tank principle were converted to the pail system. Some extension was also made in the drainage, and a satisfactory arrangement arrived at for the disposal of refuse.



portions. The principal peculiarity is in the shape of the back, which projects prominently forward, while that portion of the fire basket beneath it recedes, giving it somewhat of the character of a retort, causing an intense heat to be generated, which produces more perfect combustion, and causes the hydrocarbons to be more effectually consumed, reducing smoke in a corresponding ratio. Mr. Pridgin Teale's economiser is attached to the bottom of the bars in front, which, by means of a ventilating slide, enables a quick draught or slow combustion fire to be obtained at will. This grate has been extensively adopted since its introduction,

BARNSELY URBAN.—No great schemes of improvement were carried out in Barnsley during 1882, but much good work of an unpretending character was accomplished. Thus, 185 of the old-fashioned conveniences with open ashpits were pulled down and replaced, whilst 43 others were altered. Some progress was made in the ventilation of the sewers, but the question of an improved system of refuse removal has been postponed. In referring to the past work of the authority, Dr. Sadler finds some cause for congratulation in the fact that the death-rate amongst infants and amongst children was, with one exception, below any registered in the borough during the last fifteen

years, that the mortality from continued fever has diminished, and that the influence of a pure water supply was discernible in a lessened fatality from diarrhoea. The total number of deaths due to the town was 646, which, based upon a population of 29,789, was equal to a death-rate of 21·68 per 1,000. The zymotic mortality arose exclusively from four diseases—scarlatina, whooping-cough, diarrhoea, and fever, with a death-roll of 87, or about 3·0 per 1,000 of the population. The outbreak of diarrhoea was confined principally to August and September, scarlatina to September and October, and whooping-cough to November and December. Chest affections were also very fatal during the last two months of the year, when 41 per cent. of the total number of deaths occurred. The past year was marked by a widespread epidemic of measles, which accounted for no fewer than 45 deaths out of a total referred to the principal zymotic diseases. With but four exceptions all the sufferers were children under five, and the infantile death-rate was, in consequence, much higher than usual. The general rate of mortality (23·53 per 1,000) exceeded any recorded since 1875, although it was below the average of the preceding ten years.

BRANDON AND BYSHOTTLES.—The circular issued last year by the Local Government Board in view of the prevalence of cholera in Egypt, and of the possibility of the disease reaching these shores, seems to have produced, at any rate in this district, excellent results. Referring to the subject in his last report, Mr. Blackett observes 'the Order of the Central Board has been attended to, and everything done to put the district into as wholesome a condition as times and circumstances allow. Your Board and the officers are amply rewarded for the trouble by having a death-rate of 16·31 per 1,000.' The district seems to have been thoroughly and systematically inspected, and to this the health-officer attributes the absence of fatal sickness, disease, and mortality. From the principal zymotic causes the deaths numbered 29, equivalent to a rate of 2·29 per 1,000, no fewer than 18 being referred to fever of an enteric type. For the most part Mr. Blackett was unable satisfactorily to account for this serious mortality from a disease so intimately associated with filthy surroundings. He notes, however, that death generally happened 21 days after the attack. Measles and scarlatina together accounted for six deaths, 'which, with a migratory population, may be expected,' and diarrhoea for a similar number.

BUILT RURAL.—A considerable portion of Mr. John F. Herring's interesting report is occupied in examining the circumstances attending a widespread and fatal outbreak of whooping-cough and a less destructive epidemic of scarlet fever. In the spring and summer of 1883 whooping-cough was universally prevalent throughout the district. Where it began, or from what source it originated, Mr. Herring cannot say, a large number of cases having occurred before he heard of the outbreak. Of the eleven deaths registered from this cause, three happened in one family, the disease proving fatal within seven days. There was nothing particular about the cottage inhabited by these people except perhaps that its surroundings were more than usually damp; and Mr. Herring asks whether it may not be that such accompaniments, as in the case of diphtheria, assist in the development and propagation of the disease. In connection with the outbreak of scarlet fever, the health-officer notes that whilst there were numerous cases all over the district, and in a neighbouring village forty sufferers, no fatalities were registered except in the village of Howey, which furnished all the four deaths from the disease. In 1882 the authority were at some pains and expense to provide a small scheme of drainage for the village, and at the same time closed four cottages which were unfit for habitation. Inquiries were made as to the water supply, which was found to be of good quality and of sufficient quantity, the only drawback being, occasionally, a difficulty of access. Altogether the village has had more than its quota of sanitary supervision,

yet in an epidemic of seventeen cases, four, or 23·5 per cent., proved fatal. Mr. Herring is at a loss to account for this, but he points out that the village is badly situated, and the houses, which are of a very low class, naturally damp. The death-rate from zymotic diseases was equivalent to 2·21 per 1,000, and from all causes to 20·12.

CAMBRIDGE URBAN.—For obvious reasons, the sanitary circumstances of Cambridge possess more than local interest. Much progress of a general kind has undoubtedly been made of late, but the Council have still ample work before them. In his report for 1882, Dr. Annington spoke of the condition of one locality as follows: 'As to Romsey town, only little improvement has at present been effected; indeed, until some combined public measures are adopted, any great improvement is difficult of accomplishment. Here are a number of dwellings approaching to 200, built without any better means of excrement disposal than leaky or overflowing cesspools and "guzzle" holes, with no surface drainage, and with roads that are at times nothing better than quagmires.' The only happy circumstance in this locality is the opportunity of getting a good supply of wholesome water from the company's mains. The defective sanitary condition of Romsey town has attracted the attention of the Local Government Board, whose inspector, Major Tulloch, has recently visited the place and reported it to be in a most shocking and disgusting condition. There was an exceptionally fatal epidemic of measles in 1883, and scarlatina maintained the fecundescence which commenced in 1881. The mortality from whooping-cough and typhoid fever was below the average, and neither diphtheria nor small-pox was fatal in any one case. The general death-rate was equivalent to 18·0 per 1,000 of population, comparing with 16·2 per 1,000 in 1882. We trust that the public attention recently directed to the abominably unsanitary condition of the Cam will not be lost upon the Corporation.

CARLISLE.—Mr. William Brown, successor to the veteran Dr. Elliot, has lost no time in bringing into prominence the many defects in the sanitary condition of his district. Especial attention is drawn to the danger which threatens its water supply by sewage contamination. The sanitary authority should bear in mind the terrible consequences that have followed the consumption of polluted water, and should not relax their efforts to secure improvement until the slightest possibility of contamination has been removed. The condition of the slaughter-houses is scarcely of less importance. It is quite common, Mr. Brown writes, to find water-closets and ashpits in close proximity to the slaughter-houses, and manure heaps upon which blood and other refuse putrefy and pollute the surrounding air are inseparable from slaughter-houses of this description. Such conditions cannot fail to lower the health of the inhabitants, who are by circumstances compelled to live within their immediate vicinity, to say nothing of the serious dangers arising therefrom during the prevalence of zymotic disease. This state of things has practically obtained for the past forty years, despite the constant appeals of the late health-officer to secure the erection of an abattoir. This, indeed, is the only remedy, and it would, if adopted, put an end to the present extensive traffic in diseased and unwholesome meat. It is not remarkable that the 'trade' should object to the erection of a central slaughter-house, but the time has arrived when, in the interests of the public health, such considerations should be put aside. From every point of view the health of the town in 1883 was much better than of late years. Zymotic diseases accounted for 67 deaths (with a death-rate of 1·8 per 1,000), against 189 in the previous year. An epidemic of scarlatina, fatal to 23 children, demonstrated very forcibly the influence of schools in spreading infection, and the occurrence of a few cases of typhus showed the value of immediate isolation and disinfection. Each case of typhoid fever, from which eight deaths were registered, was carefully investigated, but in the majority of instances the cause was not ascertainable. The general death-rate,

equivalent to 21.0 per 1,000, was 3.7 below the average for the last nine years.

CHESTER.—Dr. Kenyon reports that steady progress has been made in effecting structural alterations in the drainage of houses by the substitution of glazed earthenware pipes, with proper fall, for old and unsatisfactory arrangements. In all cases the new drains are efficiently ventilated, and waste-pipes disconnected. The ventilation of the sewers, which was completed in 1878, has exercised a marked influence on the mortality from typhoid fever, the deaths from this disease during the five years ending 1883 being exactly half as many as in the five previous years. An examination of the tables of cases of infectious disease coming to the knowledge of the health-officer shows more strikingly the same decrease. During the five years ending 1878, 227 cases of measles were reported; during the five subsequent years 97. With regard to scarlet fever the numbers are respectively 332 and 120; of typhus 25 and 4; of typhoid 216 and 129. Although, as Dr. Kenyon points out, other agencies have been at work, he thinks that the ventilation of the sewers has clearly been followed by a great improvement in the public health. There was a remarkable diminution in the mortality amongst children, and there was also a slight reduction in the deaths of persons at the other end of life. From all causes the deaths numbered 708, being equivalent to a rate of 18.43 per 1,000. But little trouble was caused by zymotic complaints, none of which were present in an epidemic form.

DERBY.—A noteworthy feature of Mr. Iliffe's reports is an exhaustive account of the working of a Local Act, requiring the compulsory notification of infectious disease; but, as this was referred to at some length in our notice on his report for 1881, the subject may now be passed over. The death-rate registered in 1882 (18.7 per 1,000), was the lowest ever chronicled up to that date, whilst that for 1883 (18.2 per 1,000) was even lower, and was less by 1.6 than the average for the previous six years. Scarlet fever was the most prevalent and fatal of the zymotic diseases during 1882, causing, amongst some 770 cases, 63 deaths. In 110 instances the patients were removed to the infirmary, many others being refused admittance for want of space. This reflects a state of things by no means creditable to the Town Council, who seem to possess but one hospital, which is restricted to cases of small-pox. Scarlet fever is an eminently infectious and dangerous disease, and, while the borough remains in its present unprotected state, so long will the task of limiting the spread of infection be next to hopeless. Mr. Iliffe properly draws attention to the subject, and it is to be hoped that his recommendation for further hospital provision will receive practical recognition. The zymotic death-rate of 1883 was the smallest ever recorded. Whooping-cough was very prevalent, and there was an increase in the number of deaths from diarrhoea, but the mortality from typhoid exhibited a marked decrease as compared with 1882.

DONCASTER COMBINATION.—In an interesting report for 1883, Dr. Mitchell Wilson observed that an active prosecution of sanitary works in the rural districts has done much towards lowering the death-rate. There is, however, a danger lest the full benefits of such works should not follow them for want of clearly understanding the purpose desired in carrying out, say, the protection of drinking water, in sinking wells, in the disconnection and ventilation of house-drains and in the reconstruction of privies, ashpits, &c. Country workmen have as yet a great deal to learn about such matters, and it is to be regretted that they so seldom avail themselves beforehand of the advice readily afforded by sanitary officers. Bad workmanship is disappointing both to him that pays, and also in its beneficial effects, and it would be of interest to all alike if a plan or description of such works and alterations had first to be submitted to the sanitary authorities. The average death-rate of the four rural districts

was equivalent to 19.1 per 1,000, and in the three urban districts to 18.1 per 1,000. The zymotic rate ranged from 1.1 at Selby to 3.7 at Goole.

DURHAM RURAL.—Sanitary work was rapidly pushed on in this district during 1883. Badly-constructed drains were amended, sewers on an extensive scale were constructed, and nuisances abated as promptly as the circumstances of the various colliery villages would permit. Much still remains to be done, notably as regards improving the water supply and the removal of refuse. Mr. Blackett states that, except in cases where the owners of collieries employ their own workmen and carts to remove the contents of privies and ashpits, there is considerable difficulty in getting them removed as often as necessary. The remedy for this is the adoption of sec. 42 of the Public Health Act, which confers upon sanitary authorities the power of themselves undertaking or contracting for the removal of house refuse. Small-pox caused much trouble and anxiety during the year, the spread of the disease being largely assisted by the gossiping habits of the people, and a general aversion to, and neglect of, vaccination. The infection was first imported into Tudhoe by a woman, who was attended by an unqualified practitioner. In consequence of the cause of death being incorrectly stated, the health-officer did not hear of the case until fifteen days afterwards. During this interval the real nature of the disease had been concealed, and on making examination of the houses in the same street and elsewhere Mr. Blackett found six other cases. Precautionary measures were at once adopted, and in about a month the infection seemed to be stamped out, not, however, before it had been carried to several adjoining townships. There was little prevalence of other zymotic disease, which may account, perhaps, for the summary manner in which the health statistics are discussed. The death-rate from all causes represented a rate of 19.39 per 1,000 of population.

GUISBOROUGH, LOFTUS, SKELTON, AND BROTTON.—Dr. Stainthorpe did not succeed to the health-officership of this combined district until 1882 was well advanced. A maiden report should not be judged too narrowly, but in future statements Dr. Stainthorpe will do well to give the result of his recommendations for improvement, in addition to a record of his own personal work. The reports might also be prefaced with advantage by some general remarks, taking the five districts as a whole, and giving in a brief form the history of the year. This plan is usually adopted by health-officers serving a number of districts which, as in the present instance, have been combined by an order of the Local Government Board; and although the plan is not actually prescribed by that body, it is almost universally carried out. Scarlet fever, whooping-cough, and enteric fever seem to have caused most trouble during the year 1882. In commenting on the peculiarities of this last disorder, Dr. Stainthorpe is strongly of opinion that the ordinary privy acts more frequently than is supposed as a channel for the spread of the disease. Very often there is no other receptacle for the excreta of enteric fever patients than the common ashpit, and the complete emptying and disinfecting of these places is not easy. For this reason, amongst others, he advises the use of the pan-closet, which minimises the amount of excreta stored at any time upon the premises, and ensures its speedy removal, permits of the more easy disinfection of the closet and its contents, and prevents the soil from becoming soaked with sewage. With the exception of the fatality amongst children, which was alarmingly high, representing in one district as much as 60.0 per cent. of the total deaths, the general death-rates were fairly satisfactory, regard being had to the occupation of the inhabitants. In his report for 1883 Dr. Stainthorpe states that, 'believing it would prove advantageous, I have combined into one the reports for the four urban and one rural sanitary authorities forming the Guisborough combined district,' though the individual reports for each district are not forthcoming. From all causes the deaths numbered

631, of which 294 occurred in children under five, yielding a percentage of 46.0 per cent. In connection with the prevalence of infectious disease, Dr. Stainthorpe notes that for some months a voluntary system of notification has been in force, and has so far been of considerable service. The results of the sanitary inspections conducted during the year are carefully set out in a tabular form, which, however, requires further elucidation and comment.

HARTISMERE RURAL.—In his last report Dr. Barnes has been at some pains to compare the mortality statistics of Mellis with those registered in the remaining portion of the district. This parish, which contains a population of 471 inhabitants, is situated on a soil of stiff clay overlaid by a thin layer of boggy soil, and is peculiarly liable to outbreaks of diphtheria, together with a high general rate of mortality. During 1883 five cases of diphtheria occurred here in three houses. These outbreaks were independent of each other, so far as Dr. Barnes's observation extended. In one case no sanitary defects were discovered; in another, the farm buildings joined the back of the house; and in the third, the water supply was contaminated. The average annual death rate for the past twenty-four years has been 22.0 per 1,000, the mean rate for rural districts in England being 19.4. The mortality amongst infants under one year shows a still more striking excess, the percentage of such deaths to the total deaths being 26.9; that of the entire district being 20.7. The death-rate from zymotic, lung, and tubercular disease is also above the average; and Dr. Barnes is inclined to attribute this generally to excessive dampness of the soil, which in the case of diphtheria requires little verification. In the other portions of the district the health statistics present few points of interest. The general death-rate, which is estimated at 14.2 per 1,000, is considerably below the average; and there was also a decrease in the mortality from zymotic causes.

HASTINGS.—The opening of the Filsham waterworks, which Mr. Knox Shaw describes as 'the great and memorable event of the year,' was naturally an occurrence of much importance. These works, consisting of a well, pumping station, reservoir containing over 500,000 gallons, and two filter-beds, are situated in the west-end of the town. The well, bored through white sand and brown sandstone principally, yields an abundant supply of bright good water, and is capable of yielding 500,000 gallons a day, if necessary. Now that the Town Council have provided their district with a plentiful supply of water, they might well set about the adoption of some better plan for the removal of house refuse. At present the dustbins are not emptied often enough; and the method of depositing their contents at various places about the borough, even though there may not be habitations near, is most unsatisfactory. 'There is at present,' the health-officer states, 'a large collection of dry refuse and decaying vegetable matter, offensive alike to the eye and nose, situated on the borders of our beautiful public park.' Obviously, the best plan to be adopted by a district circumstanced like Hastings would be the erection of a 'Destructor,' of a kind generally used in large towns. Mr. Knox Shaw also directs the serious attention of his authority to the objectionable position of the slaughter-houses, and urges them to proceed with the erection of a public abattoir. The mortality statistics registered during 1883 were of a most satisfactory nature. The death-rate from all causes represented 15.85 per 1,000, so low a rate having only occurred twice during the past nine years. The death-rate from zymotic causes (0.76) was even more satisfactory, being 0.71 below the annual average for a similar period.

KING'S NORTON RURAL.—Mr. Hollinshead, in a concise and practical report, demonstrates to his authority the beneficial influences of improved drainage, water supply, the removal of house refuse, and the provision of means for dealing with infectious disease. The general death-rate registered in 1883 (11.77 per 1,000) is the lowest

on record, and although a considerable number of cases of zymotic diseases came under observation, the majority were of a mild type, and were attended with but a slight mortality. These diseases are more or less dependent on insanitary conditions for their development and propagation, and consequently the more cleanly the district is kept, both as regards the interior of dwellings as well as the exterior, the greater immunity will the inhabitants enjoy from sickness. Mr. Hollinshead deplores that so much ignorance is continually displayed in the matter of healthy dwellings, the poor especially neglecting the simplest laws of health. He admits, however, that year by year they are becoming more and more improved, and that there is good in all the improvements that are being carried out, and hopes for greater help from them in future. Taking the district as a whole, the sanitary authority have, under the guidance of their able health-officer, been active in the discharge of their important functions. Much, however, still remains to be done. The system of refuse removal is not of the best, and the state of many of the roads is capable of great improvement. But few deaths properly due to King's Norton were registered from zymotic causes in 1883. A number of cases of diphtheria (two fatal) occurred, and were dependent upon local insanitary conditions, the removal of which arrested the spread of the disease. No deaths were registered from typhoid fever, although 14 persons were reported as suffering from it, inquiry into the circumstances always revealing either defective drainage or polluted water supply. Mr. Hollinshead draws special attention to the freedom which the district enjoyed from invasions of small-pox, notwithstanding the prevalence of the disease in adjoining towns, and looks to the rigorous adoption of vaccination, and the provision of means of isolation, as an explanation of this satisfactory immunity.

LIVERPOOL PORT.—The number of vessels entering this port in 1883 is put down by Dr. Taylor, in his annual report, as 21,452. Of these, 4,750 were inspected by officers of the Health Department, with a result that, in 283 cases the sanitary arrangements were regarded as defective, viz.:—In 147 vessels the forecables, peaks, deck-houses, and cabins required thoroughly cleaning out, and painting, or limewashing—in some cases partially refitting; in 28, the bulkheads were faulty; in 54, there were defective ventilators; in 42, insanitary closets; and in 12, the decks over the quarters occupied by the crew required caulking. An improvement was noticeable in the general state of the coasting and short voyage regular traders. There appears to be considerable room for amelioration in the condition of the French, Spanish, Italian, Russian, and Greek vessels; on the other hand, the state of the German, Danish, Belgian, Dutch, Norwegian, and Swedish vessels is satisfactory. Dr. Taylor states that the American vessels retain their excellent character, and that the Liverpool-owned ships are all that can be desired. This is especially true of the Atlantic liners, the sanitary arrangements of which are described as being 'complete,' the light, height, and ventilation of the steerage decks being in every way satisfactory. On one line, there are permanent, well-fitted, rooms with mirrors in the steerage for families, the whole being lighted by electricity.

MIDDLETON AND TONGE.—The year 1883 was the healthiest that this district has enjoyed since 1874. Still Dr. Graham states that a great deal remains to be done in the way of sanitary reform. The time, he thinks, has arrived, when all old middens should be abolished, and a better system provided for the removal of night soil. Several houses are unfit for habitation, and should be condemned, while many of the streets require better sewerage, paving, and putting in repair. The principal sanitary work during the past year appears to have been the conversion of 103 privies into pail closets, and the trapping and making good of the drains of 120 old cottages. From all diseases, the death-rate was nearly 20 per 1,000, and from zymotic diseases, 0.89.

IRON.—Amongst other circumstances which make Kingston's task in reporting on the health of this far from congenial, are the enormous mortality of infants, and the fatal prevalence of consumption. The heated atmosphere in which the cotton operatives and their working hours renders them very susceptible to sudden chills, and it has also the effect of them to keep closed the doors, windows, and doors of their sleeping rooms, with the result of im-ventilation and a tainted air essentially favourable to the growth of the seeds of consumption. Moreover, the warm climate, it tends to the precocious development of the young, early marriages, and a weakly offspring.

As regards its rate of infantile mortality the enjoys an unenviable reputation, the deaths of under one year representing nearly a third of the total. The causes to which much of this fatality is clearly point to the absence of that maternal care and attention to the welfare of infant life, and to the defec-tions which surround the dwellings of the lower classes. The general death-rate was as high as 1,000 in 1882 and 23.79 in 1883. The prevalence of typhoid fever amongst the mill operatives, and the noxious influence of drain air has already been mentioned in these columns (*see* SANITARY RECORD, 3, p. 22). With the exception of small-pox, all other diseases were present in a more or less severe form in 1883, the most notable outbreak being that of typhoid which caused no fewer than 220 deaths.

NEWCASTLE.—The sanitary work which has been carried out in this borough during the ten years 1874-83, is capitulated in Dr. Shea's report for 1883. In addition to a complete system of sewers, and a sewage pumping station have been constructed. The borough has been provided with new surface water drains, and 8,000 houses have been connected with the main sewer. Fresh waterworks have been built, nearly all the wells in the borough have been closed, and the old water supply has been laid on instead. A sanatorium for infectious cases has been supplied, and additional provisions have been made for isolating paupers. Such are the chief improvements which have been effected in the last ten years, and which furnish ample justification for the statement that Reading has made great strides in the progress of sanitary reform. That the work accomplished in the last five years, we have a sure proof in the decline of the death-rate from 18.84, in the five years 1874-78, to the five years 1879-83. With regard to the year 1883, there is but little to mention, except that the sanitary condition was a very healthy one. The ordinary death-rate was as low as 15.90 per 1,000, while the death-rate was only 2.1. Measles and whooping-cough were again the chief causes of zymotic mortality. Deaths among infants were equivalent to 10.8 per 1,000 children born.

TYNE PORT.—The sanitary work accomplished in this port of this authority in 1883 was greatly in excess of that of any previous year. The number of vessels inspected was 11,572, or nearly twice as many as in 1882, which itself was far in advance of any of its pre-

decessors. Mr. Armstrong attributes the increased work to the facility afforded for visiting vessels, and to the amount of crew space provided. Lighting, heating, and drainage were, however, frequently defective. The water-closet was often insufficiently separated from the fore-cabin, and not always efficiently

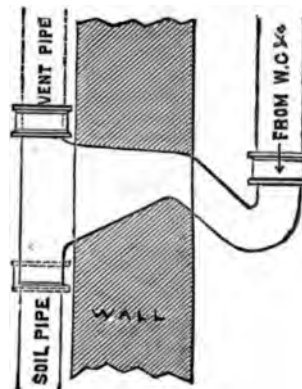
flushed. The condition of coasting steamers was, generally speaking, satisfactory. The cases of sickness numbered 98, 11 of which were of an infectious nature. The need of extended and permanent hospital accommodation was shown very forcibly during the year, and the authority would do well to give the subject their immediate and earnest consideration.

TORQUAY.—Among other incidents, the year 1883 was marked, in this district, by the completion of the Sanatorium, the arrangements of which appear to have met with general approval. Mr. Karkeek has something to say with reference to the scale of charges which has been drawn up, and which, in his opinion, requires some modification. In the case of the labouring classes, he advocates free admission to the institution, for, as he properly argues, the building has been provided, not so much for the treatment of infectious disease, as to prevent its spread; and if, in addition to overcoming the great natural antipathy which the poor have to parting with their children, there is also a payment asked for this treatment, the one chance of really stopping an epidemic, viz., that of isolating the first few cases, will be lost, and the utility of the Sanatorium greatly restricted. The deaths during the year, 414, or 16.9 per 1,000, were above the average. To zymotic diseases, 33 deaths were attributed, nearly half of which resulted from whooping-cough. But the disease attended with most interest was typhoid, of which 11 cases were reported to the medical officer. In most instances the disease seems to have occurred after an exceptionally heavy rainfall—1½ inches in 2 hours. From these cases, Mr. Karkeek draws several valuable deductions, of which, perhaps, the most noteworthy is, that the inhabitants of some houses appear to become fever-proof. Another case tended strongly to show that typhoid is an infectious disease—a fact which is not always recognised.

ILLUSTRATED SANITARY PATENTS.

ENGLISH.

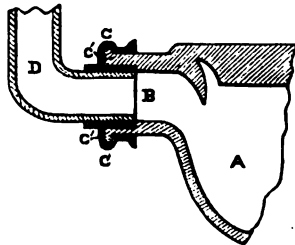
38. (1884). IMPROVEMENTS IN SANITARY TRAPS. W. HENMAN, Architect, Birmingham. [4d.]—The improvement is in the form of traps for water-closets and for bath, lavatory, sink, and urinal wastes, by which security is obtained from the inflow of sewer-gas to buildings. The outer arm of the trap is funnel-shaped, and is made in one piece with or jointed to a short length of vertical pipe, by which connection is to be made with the soil-pipe below,



and with the ventilating-pipe or soil-pipe above. The inner arm or arms are placed at about an angle of 45° to receive the connecting-pipe from the water-closets, baths, &c. The trap may be of any suitable dimensions, and be made of glazed earthenware, or stoneware, or cast iron, either plain, glazed, or galvanised, of lead or other metal.

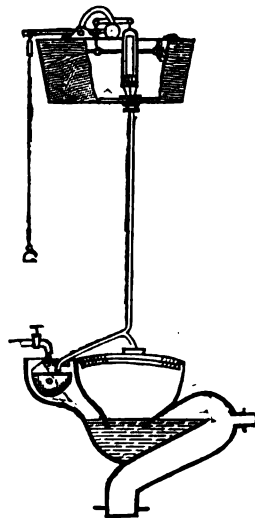
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657. (1884.) IMPROVED MEANS OF CONNECTING SUPPLY APPARATUS WITH WATER-CLOSET BASINS. T. W. TWYFORD, Hanley, Staffordshire, Manufacturer. [4d.]—The patentee claims for an improved means for connecting the supply apparatus with water-closet basins. A is the basin, and B is the projecting arm on the said basin. D is the supply or flushing-pipe, which may be of



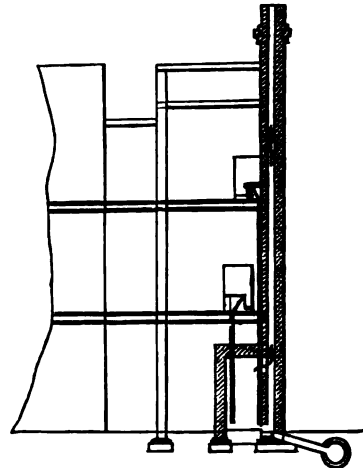
lead or other material; c is the connecting-piece or ring, which may be of either India-rubber or other elastic or flexible material. It will be noticed that the ring c has a large surface to bear upon the pipe, D, and also that the branch or arm, B, is embraced by the joint, c, on both the outside and the inside, as it rests in the annular recess, c'. There is thus a pressure on every surface, the action and reaction of the joint all tending to keep the required surfaces tight.

1046. (1884.) IMPROVEMENTS IN WATER-CLOSETS AND APPARATUS CONNECTED THEREWITH. H. SUTCLIFFE, Halifax. [6d.]—The patentee constructs the trap and bowl or basin with an extended chamber, on the same level as top and bottom of the basin. The chamber is so constructed as to receive a suitable tipping or swinging vessel, which is supplied from a cistern provided with a skeleton valve for the rapid discharge of water into the said tank, which when full immediately discharges itself with full force in one volume into the said basin, thereby perfectly cleansing it out. He also constructs the said trap and bowl or basin to work with a ball-cock, which are



so fixed in said chamber and so constructed as to wash the basin and supply the tank at the same time; when full, and the handle of closet is lifted, the whole quantity of water in the tank is discharged in one volume into the basin, thereby perfectly cleansing it out. Another construction is to supply the basin with extended chamber by a continuous stream of water.

2,184. (1884.) IMPROVEMENTS IN COLLECTING, &c., OF EXCRETA, &c., AND IN APPARATUS THEREFOR. CONWAY SCOTT, C.E., Belfast, Ireland. [6d.]—This invention is to provide a convenient place and means for depositing and collecting the excreta and other refuse of dwelling and other houses in order that the injurious and offensive stench and gases emanating from such matter and the receptacles therefor may be rapidly carried away into the higher atmosphere, and that the matter itself may be frequently removed and the receptacles for it emptied and cleansed, and also to prevent sewer or other gas generated by the decomposition of such matter from enter-



ing the dwelling or other houses. The above is a ground plan of a house and tower or shaft, with a connecting gangway or passage, and showing the pit or chamber for the reception and collection of refuse matter with the vertical pipes and ventilators, the ports or doors for throwing matter into and discharging same from the pit or chamber, the ventilating chimney and flue, the overflow into the sewer, and the pipe from the sewer into the ventilating shaft.

2,524. (1884.) IMPROVEMENTS IN INSPECTION-PIPES FOR DRAINS, &c. G. C. DAVIES, Clerk of Works. [4d.]

The novelty of this inspection-pipe consists in making the cover over inspection aperture gas-tight, by means of a groove and tongue joint, this joint being stuffed with India-rubber, or such like stuffing; or for ordinary purposes white lead mixed with a little tallow, or any other suitable mixture will do, the said cover being secured to the pipe by screws, so as to prevent any escape of gas, or



FIG. 1



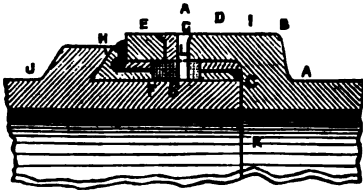
FIG. 2

the joint being broken. The cover over the aperture requires no skilled labour in fixing or unfixing, it being only necessary when fixing the cover to notice that the parts forming the joints are kept clear of dirt and that the groove in the cover is properly filled with the stuffing material, the cover being then placed in position and screwed down. Fig. 1 is a plan of this improved inspection or access pipe, A, being the movable cover over the

inspection aperture. B, H, metal screws for securing same to pipe. C, C, eyes (when necessary) for lifting the cover. Fig. 2 is a transverse section (enlarged scale) through the centre of pipe showing the joint of cover and the method of maintaining the inside form or bore of pipe.

4,357. (1884.) IMPROVED JOINT FOR WATER AND OTHER PIPES. W. HASSALL, agent, Beeston, Notts. [4d.]

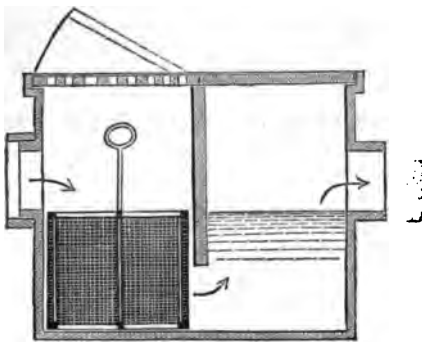
This invention consists in an improved method of making the joint between two lengths of any suitable material, of any suitable section, and can be employed for conducting water, sewage, gas, compressed air, or other liquids or fluids, &c., &c. The sketch shows as part section:—One end of the pipe A is provided with a socket B of an extra depth, at the extreme inner end of which the body of the pipe is made with a shoulder C, and at the



inner end and adjoining the shoulder C a ring D of suitable material is cast in from a mould the face of which is perfectly cylindrical. A ring E of suitable material is also cast in the mouth of the socket. Between these two rings there is an annular space F in the socket, and through the socket into this space an opening G is made through which to run in the filling-in material, such as Portland cement. The spigot end of the pipe A which enters the socket B is thickened and made perfectly cylindrical by casting two rings of suitable material, H, I, on the same in such positions as brings them exactly opposite to the two rings, D, E, in the socket when the pipes are driven together, and which rings keep the invert of the pipes in true line.

6,306. (1884.) IMPROVED GREASE-INTERCEPTING GULLY-TRAP FOR SINKS. E. PAGE, Architect, Forest Gate, Essex. [4d.]

This gully trap would be constructed of glazed stoneware in one piece, with a central division forming trap, rebated round top to receive a combined galvanised cast-iron grating and cover. The portion over compartment taking waste from sink would be hinged to

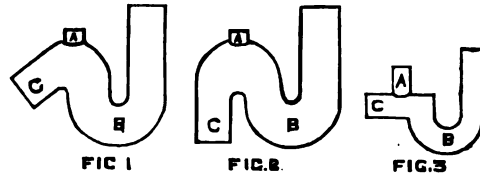


open. The gully trap would have an inlet and outlet opening cast on each end with socket for connecting to waste from sink and to drain respectively. The compartment taking the waste from sink is provided with a moveable galvanised wirework grease receiver which will allow the passage of the water while it intercepts the grease and other foreign matter, and so prevents the same passing the trap and so stopping the drain.

10,460. (1884.) IMPROVED TRAP FOR WATER-CLOSETS, &c. E. NEWTON, Hitchin, Engineer, Herts. [4d.]

The object of this invention is to afford a ready, cheap,

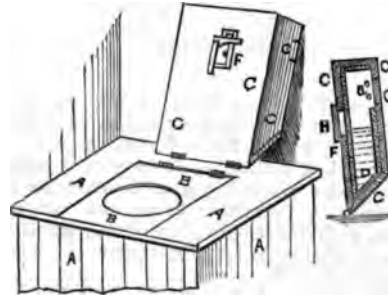
and effectual means for ventilating water-closets and other sanitary appliances, and for preventing syphonage from the traps. Fig. 1 of the accompanying drawings is a vertical section through a P-shaped trap cast in lead, and having



the upright foul air or gas outlet shank A between the trap part B and the outlet part C. To this shank A a ventilating pipe is readily connected by soldering or otherwise. Fig. 2 shows an S-shaped trap having the shank A similarly applied. Fig. 3 shows an overflow trap-pipe having the shank A applied in a similar manner.

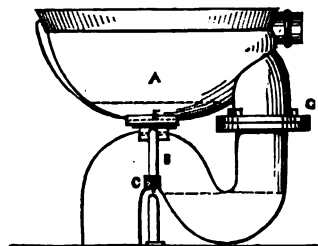
AMERICAN.

298,091. DEODORISING AND ANTISEPTIC WATER-CLOSET COVER: FREDERICK H. HUBBARD, Brooklyn N.Y. Issued May 6, 1884.



Claim.—1. The combination, with a hinged water-closet cover made in box form, of a non-corrosive vessel arranged in said cover and provided with a number of fine perforations in its bottom. 2. The combination, with the hinged hollow water-closet cover C, having an opening F, in its lower surface, of the non-corrosive vessel D, arranged in said cover and provided with the fine perforations G in its bottom over the opening of the cover. 3. The combination, with the hinged hollow cover C, provided with the opening F in its lower surface, and the vessel D, arranged in said cover and provided with perforations G over the opening of the cover, of the flap H, hinged to the cover, near the forward edge of its opening. 4. In a water-closet cover, the non-corrosive interior vessel D, with its rear part closed at the top, and fine perforations in its bottom, whereby the liquid contents of the said vessel will be allowed to drip when the said cover is closed, and the dripping will be prevented and the said contents kept from being spilled when the cover is opened.

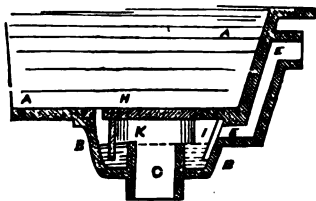
298,804. ADJUSTABLE SUPPORT FOR WATER-CLOSET BASINS: HENRY CORY WEEDEN, Boston, Mass. Issued May 20, 1884.



Claim.—1. In combination with the basin of a water-closet, an adjustable support B, U 2

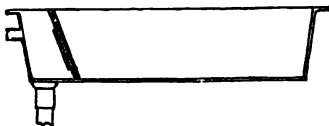
closet, a supporting-standard, having supports of adjustable length adapted to carry said basin and support it at the desired height. 2. In combination with a basin of a water-closet, a supporting or levelling standard, having supports of independently variable length, adapted to carry the said basin and support it at the desired height and on the desired level. 3. The improved adjustable support for water-closet basins, consisting of a cross-bar *E*, connected with vertical extensible standards *B*, provided with means for securing the standards in place at any desired height. 4. The improved support for water-closet basins described, consisting of a cross-bar *E*, carried by extensible standards *B*, provided with means whereby the length of the standards may be regulated, and also with means whereby the cross-bar may be attached to the standard at a varying height thereon.

298,841. TRAP FOR SINKS, &c. : HENRY FRIEDRICH, East Port Chester, Conn. Issued May 20, 1884.



Claim.—1. The sink *a*, having dish *b*, upward extending outlet *c*, and ventilating-channel *e*, in combination with strainer *h*, having flange *k*, and wings *i*. 2. The combination, in a basin-trap, of an annular dish around the waste-pipe, a ventilating-pipe, a removable strainer-plate, having a depending flange and wings at the under side, such strainer-plate having an irregular form at its edges, so that it can only be entered one way into its recess around the dish.

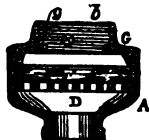
300,130. SINK. CHARLES T. REGAN, Brooklyn, N.Y. Issued June 10, 1884.



Claim.—1. The combination, with a sink, of a compartment for the reception of sewer-gas, arranged within the sink, and a pipe or passage for conducting away the gas which may arise within the chamber. 2. The combination, in a sink, of a cap or cover *a* at one end, and a slide or door for separating the sink into an open and a closed compartment, the closed compartment being provided with exit-pipes for the discharge of water and gas respectively. 3. The combination, in a sink having outlet *C*, of a ledge or cover *a*, and a slide, having serrations or perforations, as described, whereby a closed chamber or compartment for the reception of sewer-gas is produced, and the matter which passes from the open to the closed compartment is strained.

300,367. FILTER. BENJAMIN HOLLAND, JR., Providence, R.I. Issued June 17, 1884.

Brief.—The part *E* is composed of felt.

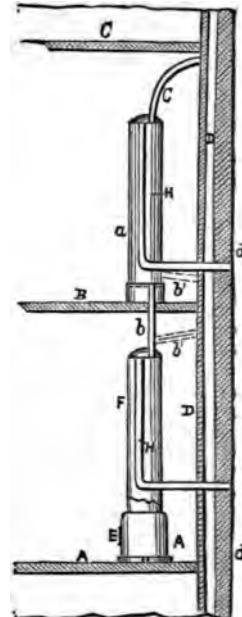


Claim.—The combination and arrangement, substantially as shown and described, in a filter, of the shell *A*, having the internal foraminous shelf *D* cast therewith, and

forming chambers above and below the shelf, the ing cap or cover *G*, screw-threaded to engage an screw-thread in the shelf to connect the two, and of felt or textile filtering substance *E*, supporting said shelf, and held in place by the said cap screwed down upon it.

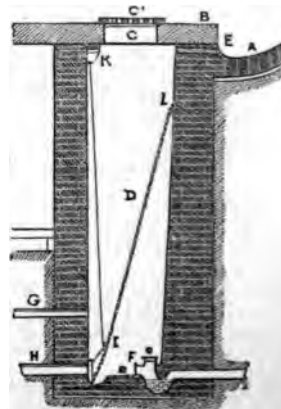
300,075. HEATING AND VENTILATING DEVICES. BUILDINGS. AMANDA M. HICKS, CLINTON ALONZO DISHMAN, Paducah, Ky. Issued June

Claim.—The combination of the stove *E* with *F* on the lower floor *A* of a building, one or more drums *C* on the floor or floors above, pipes connecting the upper portion of each under drum lower portion of the drum on the next floor above escape-pipe *c* for the gaseous products of combustion chimney *D* of the building, and the independent pipes *H*, arranged one above the other within



and through the chimney to the external atmosphere open at their upper or inner ends to the rooms or the drums, as shown and described, and for the purpose set forth.

297,643. SEWER : THOMAS L. STARK, Chicago. Issued April 29, 1884.

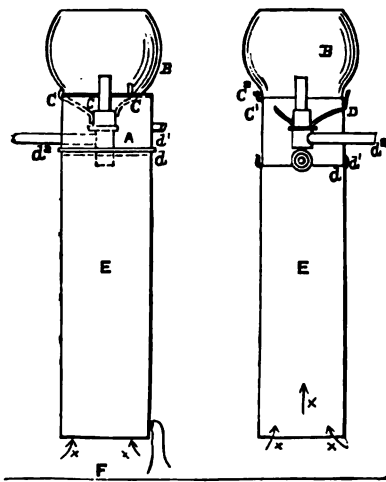


Brief.—A basin or well, into which empties the

drain and gutter-pipes, has a manhole and cover, and overflow-pipe connecting with the street-gutter, and a discharge-pipe emptying into the main sewer. A valve applied to the mouth of the house-drain pipe is operated by a rod secured in raised or lowered position.

Claim.—1. The combination of the well, the house-pipe H, entering the said well or basin, the pipe F, entering the said basin and communicating with the main sewer, a valve or door applied to the discharging end of the pipe H, and means for opening and closing the said valve. 2. The combination of the basin D, the pipes H and F, the valve I, the rod J, and means for retaining it in its raised and lowered positions, the pipe or duct E, the hole or opening C and its cover, and the roof-gutter pipe, all arranged substantially, as shown.

296,320. GAS-BURNER FOR HEATING AND LIGHTING ROOMS: BENJAMIN F. ENOCH, Philadelphia, Pa. Issued April 8, 1884.



Claim.—1. The combination of a gas-burner, a globe or shade therefor, and a tube inclosing burner below the shade or globe and hanging pendent therefrom. 2. In combination with a gas-burner, a globe, a balcony for the globe inclosing the burner, and a flexible tube supported thereby and depending therefrom to near the floor of the apartment wherein such fixtures are located for use. 3. The tube, D, having a slot, d' , and provided with means for attaching it to a gas-burner, and a beaded or flaring edge d , in combination with pipe or hose E, and means for attaching it to said tube. 4. In a heating attachment for gas-burners, the combination of a tube, D, provided with means for attaching it to a gas-burner, a flexible pipe, E, and means for contracting the lower opening of said pipe.

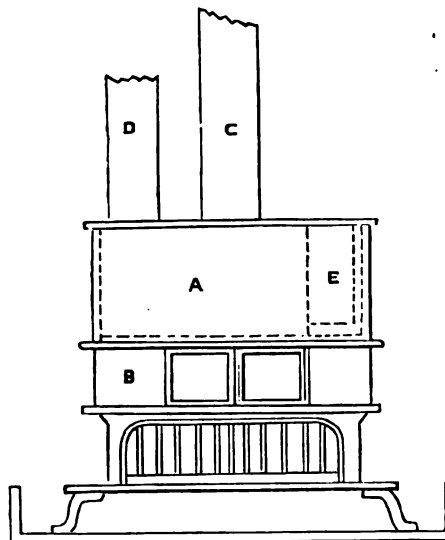
NEW INVENTIONS.

HOT-AIR CHAMBER FOR WARMING ROOMS AND OFFICES.

At a recent meeting of the Royal Scottish Society of Arts, Glasgow, Mr. W. G. Black pointed out that the heat given off by a stove in a room for the purpose of warming it is first afforded by radiation from the surface of the iron plates towards the walls of the apartment, and secondly by convection of heat by the charged air rising from the outside of the stove to the ceilings. The apparatus figured on page 381 now affords a third method of warming by heating the cooler air in an enclosed chamber over the fire of the stove, like water in a kettle, and discharging it in a hot stream by an effluent pipe into the body of the apartment.

It consists of a boiler of iron plate 19 inches long by

9 inches deep, and 8 inches broad, fitted on to the top of a Queen Stove No. 7, and is double lined to admit the heat of the fire below all round the sides of the inner box.



Scale about 2 inches to 18 inches.

- A. Hot-air box, double lined.
- B. Stove, Queen's.
- C. Smoke flue.
- D. Upcast tube.
- E. Downcast tube.

From the top proceeds upwards an effluent tube 3 inches in diameter and 20 inches long, through which passes the hot air from the heated box into the room, and again downwards an effluent tube into the inside of the box, 3 inches in diameter and 5 inches long, through which pass the supplies of cold air from the outside. The cold air of the room thus enters the box by the downcast tube, gets heated in the boiler, and makes its way rapidly up by the upcast tube into the room, raised many degrees in temperature, and its dampness volatilised.

If the air of the room in winter be supposed to enter the downcast tube at a temperature of 50° F., it may be heated up to 225° F. in the chamber, and then will emerge in a rapid stream out of the upcast tube at a temperature of 220° F. into the apartment. The relative humidity may also be lowered from 83° outside to 66° inside the room, and the difference between the dry and wet bulb thermometer be raised from 2° outside to 7° inside the room.

The extent of increase of heating the room will be limited by the ventilation afforded by the fireplace, and the admission of extra outside air by doors and windows, more or less opened during the use of the apartment—a temperature of 60° F. is found to be sufficiently useful, and this may be easily attained in the winter in the course of one to two hours after lighting the fire in a room. The rate of warming a room will also probably increase as the temperature gradually rises, as the warmer the air entered the downcast tube, the less heat would be required to raise it to that required for comfort by the indweller.

The temperature of the bottom of the interior of the box, or rather that of the layer of air lying on it, proves to be on trial about 5° to 10° more than that of the effluent air, at any greater or less temperature experimented on.

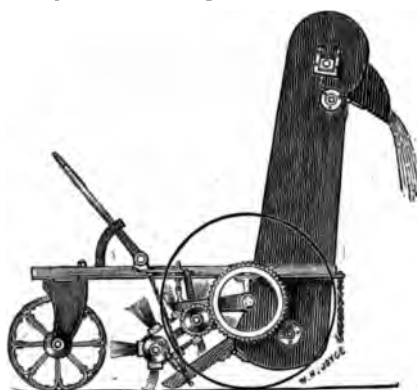
This apparatus is suggested as being suitable for rooms needing little outside draught or external moisture, such as ship cabins, observatories, laboratories, libraries, museums, &c.

The production and cessation of the warming is readily effected by removing the air-box, or returning it to its position on the top of the stove or fireplace.

Some discussion followed, in which Dr. Macadam said he did not see that the apparatus could provide for the ventilation of a room; but as far as the heating of the air was concerned, he had no doubt it would have that effect. Mr. Cay asked whether air treated as proposed would be left with the proper amount of moisture. Mr. Peebles suggested that it would be an improvement to introduce air from the outside into the heating chamber. Mr. Reid remarked that as to ventilation he had found it an effective plan to introduce ventilators into the flues as close as possible to the cornice. Mr. Black, in reply, said that the question of ventilation had not been contemplated in his contrivance. The communication was referred to a committee.

MARCH'S PATENT STREET SWEEPER AND ELEVATOR.

On the 23rd ult. an opportunity was afforded to the writer of this report of witnessing March's Patent Street Sweeper



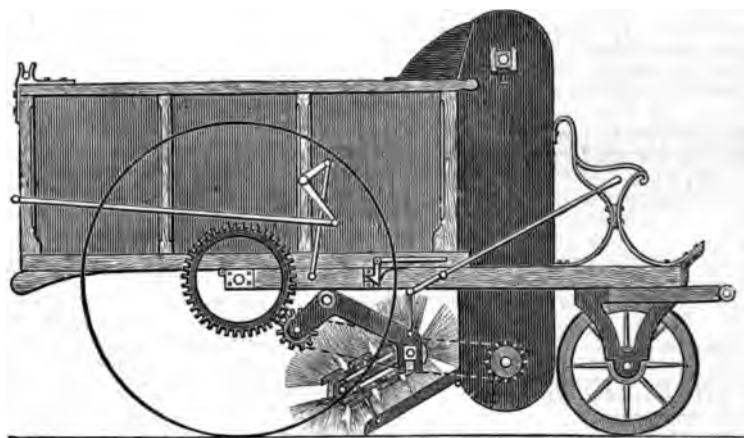
and Elevator in action, and, from the way in which it did its work, he is convinced that Mr. March has introduced

collected by means of a chain of brushes so geared that varying pressure can be applied according to the nature and quality of the road or material to be operated on, and that they may be brought down to their work as they wear away. The material collected then passes into the elevator case and by means of an endless chain of buckets is discharged through the shoot into the cart. The machine is by no means cumbersome, and requires no more skill to manage than does the one revolving brush machine, now commonly used, there being only two hand levers to work to put Messrs. March's machine in and out of gear, which is done as it proceeds along the road. It is also claimed that, going at the rate of three miles an hour, the machine will sweep thoroughly 1,200 square feet a minute of any road, and at the same time load the cart or waggon without noise or splash. It is obvious that the latter qualification alone would be deemed by foot passengers as a sufficient reason for its use, and it is to be hoped that the metropolitan authorities will see their way to its general adoption, as one or two of the large towns in the north are about to do.

Last, but by no means least, among the advantages pertaining to this machine—horses drawing it will last two to four times longer, as there is no constant stopping and starting with tons weight to draw, thereby straining the fetlocks and ruining the animals.

SPONG'S PATENT HOUSE GUARD.

MESSRS. SPONG & Co., 226 High Holborn, who have from time to time introduced a variety of ingenious domestic and other appliances, have recently patented a notable invention, which may be termed a burglar alarm. It is of simple construction, consisting of a long, shallow, flat bellows, as shown in our illustration, which can be placed under a door-mat, or even under the carpet of a room inside the window, provided an incision is made in the boards to receive it. Attached to it is an India-rubber tube which in turn is connected to a range of composition tubing carried along the ground or walls into any room in the house (kitchen or bedrooms for instance), where an



an apparatus which will prove a boon to those surveyors and local authorities who are responsible for keeping clean our streets and highways. The idea of a machine to sweep and collect mud or refuse at one operation is by no means new, having been conceived by more than one firm of engineers, but to Mr. March the credit is due for having put the conception into a workable form. Illustrations of each of the two forms in which the machine is made are appended. The first cut shows it as intended for attaching to existing carts or waggons, while the other shows it in permanent combination with a cart. The working parts are the same in both, the difference being merely in the application of the principle. The mud, slop, or refuse is

alarm is required to be heard, and a whistle is attached to the end of the tubing. Immediately any one treads upon the mat, or wherever a guard is concealed, the bellows being compressed, a loud whistle is heard, and the approach of friend or foe is thus heralded. A great advantage with this house-guard is that it is entirely automatic, requiring no attention whatever, as the bellows refills itself with air the moment the feet are removed from it; and in this respect is preferable to electric apparatus, besides being far less costly. It can also be put out of 'gear' by the inmates of a house if not considered to be required, as during the day, for instance, by merely withdrawing the India-rubber tube

the metal tube. The invention may be utilised with advantage in a variety of cases, and presents no unsightly features in connection with the fittings.

thoroughly sound in what they say concerning the various methods of domestic heating, and they give examples of objectionable and recommendable appliances and surround-



THE 'EXCELSIOR' HOME GYMNASIUM.

Following up the description of this unique apparatus, given in the SANITARY RECORD of Jan. 15, illustrations of a few more of the exercises attainable by its use are added. They by no means exhaust the list, for, as stated in the general description, about one hundred different exercises can be practised, each presenting some new feature and bringing in turn all the muscles of

ings. They very justly say that the professional advisers in respect of building new houses have not given this matter the great consideration which it most certainly deserves, and we are of this opinion also—more particularly when we know that during the severe frost of January 1881 some forty explosions of domestic boilers could be perused in the various newspapers. These disasters can only be obviated by choosing the proper system of heating, and dealing with firms who will not perpetrate 'jerry' work for any consideration whatsoever.



Fig. 15. HEALTH LIFT.
For the Neck, Arms, and Legs, to equalise the circulation.



Fig. 17. POSTURAL BOARD.
For the Treatment of Pseudo Dipsos, Hysteria, &c., and Strengthening the Neck, Loins and Abdomen.



Fig. 18. CHEST BARS.
To stretch and strengthen the Neck and Loins.



Fig. 16. Back and Stomach Roller.
For Relaxing and Strengthening the Neck and Abdominal Muscles.

body into play. The back and stomach roller, one of the attachments sold with the apparatus, is perhaps the most unique feature in these illustrations. The makers of the 'Excelsior' Home Gymnasium are the Chadborn & Iwell Manufacturing Company, Upper Thames Street, E.C.

REVIEWS.

Water Engineering: A Practical Treatment of Household Boilers and Domestic Hot Water Appliances. By FREDERICK MILAN and JOSEPH SHAW. Second Edition. Huddersfield: Broadbent & Co.

The authors of this work are consulting hot water engineers, and this treatise is intended to prove of practical use to all who have to deal with the heating of water. It is well known that boilers of too cheap a character are subject to explosion by over-pressure, and the remarks by our authors on the responsibility which entails on professional advisers or builders who make use of weak material is very deserved. The authors are

Sutton & Sons' Amateur's Guide in Horticulture for 1885.

THIS admirably arranged work for the present year is now in course of distribution, and is as complete as the most exacting could expect it to be. The efforts made of late years by such firms as Messrs. Sutton & Sons, by means of works like the one now before us, to educate the people in the art of gardening, have borne good fruit, and, while promoting the practice of an interesting occupation, have helped to improve the health of those who have time to devote to the culture of flowers and vegetables. The advances, too, that have been made in the development, as regards size and quality, of all vegetables, in which Messrs. Sutton & Sons have borne a conspicuous part, is a matter of almost infinite importance to the inhabitants of these islands; and the number of new plants and flowers that are constantly being introduced into our gardens shows how bounteous floral nature becomes when aided by scientific cultivation. In the work in question considerable space is devoted to the culture of vegetables, the instructions being simple and lucid, and a large number of illustrations are given. Turning to flowers, the information is of the most comprehensive character, and there are two beautifully coloured plates from nature, of new varieties. How to obtain flowers all the year round, and the names of those capable of easy cultivation, are clearly set forth. After supplying Her Majesty for thirty years, Messrs. Sutton & Sons have now been appointed seedsmen to the Queen and H.R.H. the Prince of Wales, being the first seed house to which this honour has been accorded.

Soils and Sites. By ARTHUR RANSOME, M.A., M.D., F.R.S., Manchester and Salford Sanitary Association. London and Manchester: John Heywood. Illustrated.

THIS pamphlet is the first of the eighth series of the Manchester Health Lectures for the People, and the people of Manchester and elsewhere may derive considerable advantage by a study of the series if this be a sample of the general idea. Though published in a small form and of corresponding price, it treats of a big subject in a thorough manner, as we find that not only Europe, but America and Africa are drawn upon for data to enable comparisons to be made and facts and theories to be contrasted. Comparisons, we know, are odious, and Dr. Ransome admits that Manchester shows up somewhat badly at times when home comparisons are made, where the by-laws relating to buildings and soils are concerned. Starting with the question of aspect, so much has already been said that the lecturer evidently concludes that it will be more useful to proceed to further conditions which are less generally known; and the next subject, *drainage*,

i.e. surface drainage, is mentioned, and instances are given of re-acting cause and effect of malaria and fever in places which are as ill-drained as they are well known. We are reminded of the action of the industrious monks of La Trappe in draining a portion of the notoriously unhealthy Roman Campagna, 'a work that has baffled all the governments from Romulus to Victor Emanuel or King Umberto. Lately they have tried, with success, a most remarkable experiment. They have bored the tufa at different distances, a metre and a half deep (about 5 feet); in these holes they have placed dynamite, and by electric conductors have exploded the volcanic strata. A dull rumbling is heard, a little elevation of the ground is seen, in some places the earth is thrown out a short distance. In eight days' time they found a subsoil for a large space of ground, and made it both susceptible to culture and healthy.' To understand the importance of this statement we cannot do better than give the reason for it. 'The soil of the Campagna has but little depth; under it lies a stratum of tufa, in some places two metres (over two yards) in depth. Under this tufa is other volcanic material equally hurtful to vegetation. Thus there is no subsoil, and no chance for circulation of water and air. When the heavy rains fall the water rests on the tufa, and generates unhealthy mists.' The efficacy of eucalyptus raising had already been proved here and elsewhere, notably in Algeria, and further instances have come under our notice in the mining districts of Spain, where trees of any kind are few and far between; not that they were at any time plentiful, but of late years the few have been ruthlessly cut down by the ever-content but improvident natives. It is, however, owing to private enterprise that the rapid-growing eucalyptus has been introduced, and the beneficial results regarding the diminution of fever are very marked. The ill-effects of *ground air* are well known, and the lecturer has deserved well in calling attention to the fact that in such air, at a depth of a few yards, the oxygen diminishes in some cases to 15 per cent., and the carbonic acid may rise to as much as 8 per cent., or 200 times more than in atmospheric air. It will be readily seen how important it is to keep such noxious air out of the house, and the ordinary remedies are suggested, viz. (1), by putting a thick layer of concrete under the cellar floor; (2), by having a cavity under this floor communicating with the kitchen flue (by the way, would it not be better to have a separate flue for this purpose?); and (3), by building the house entirely above ground without any cellar, and supported upon arches, as recommended by Dr. Richardson in his 'City of Hygeia.' This last idea is of course impossible on a general scale, owing to the expense which, roughly speaking, means an additional 10 or 15 per cent. to the cost of building an ordinary house, and then where is the builder's profit? Occupiers will not pay for it, especially as it also means a difficulty about disposing of the servants and offices, and in a town house putting the drawing-room up one floor higher, and the drawing-room, as a rule, knows little and cares less for sanitation. The first-mentioned remedy, viz., putting a layer of concrete over the entire area of the house, is indeed compulsory by the Metropolitan Building Act, and generally also where the rules of the various local boards are in force; it is fairly effective and very cheap, no slight recommendation. *Ground water* is necessarily noticed, and leads to the next heading, *The Relation between Soil and Disease*, and in reference to these the words of the late Isaac Taylor are quoted: 'When people talk about going from home for change of air, what they really mean is change of earth.' The idea may be a little far-fetched, but there is undoubtedly a substratum of truth in it. *Malarial fevers, diarrhoea, dysentery, typhoid fever, and cholera* have their due relationship shown to the action of earth and water as media for their propagation, and that terrible scourge *consumption* is likewise considered. Disquieting statistics are referred to in connection with Swindon, old and new, much to the disadvantage of the latter, which is built on Kimmeridge clay, about 100 feet

below the old town, and when we come to the end of the lecture we begin to think it is impossible to find a reasonably healthy soil or site, as some drawback is sure to be found to 'suit all circumstances.' These lectures, all applying to the house in some form, will probably open fresh trains of thought, and we look to their continuation with interest.

Overwork from the Teacher's Point of View, with Special Reference to the Work in Schools for Girls. By Mrs. S. BRYANT, D.Sc. London: Hodgson, 89 Farringdon Street. 1885.

A LECTURE delivered at the College of Preceptors by the mathematical teacher at the Camden Road High School for Girls, touching however but one small part of the subject, and, like other apologies, not in the most satisfactory manner. Mrs. (or Dr.) Bryant divides girls into six classes, which we may call the normal, the over-energetic, the over-studious, the athletic, the indolent, and the emotional. The few cases of true overwork, the existence of which she admits, are, in her opinion, furnished by the over-studious girls, who would pore over their books day and night, and who need merely to be checked; but the vast majority of the alleged cases are, she maintains, those of thoroughly indolent or excessively emotional girls, for whom the proper treatment is *well-regulated work—mental and bodily*. She asserts that doctors through ignorance, carelessness, or obsequiousness to the parents, instead of pointing out the moral character of the complainant, prescribing healthy exercise of brain and muscle, and putting a veto on dissipation and reading of an enervating kind, order relaxation and rest, which only aggravate the physical disorder. This may be true in some instances, but it is little short of a libel on the profession to ignore all that medical men have written on the subject of hysteria and its causation in aversion to the exercise of volitional, intellectual, and physical powers, and in undue attention to and excitement of the emotions. She fails to recognise the fact that those who are normally constituted both mentally and physically are properly divisible into what Mr. Teale calls hares and tortoises, that the latter are not the miserable abnormalities she represents, and that they may suffer from being forced onwards during the period of half a dozen years within which nearly the whole development of the female is compressed. This physiological aspect of the question she entirely ignores.

Her school is probably one of the best regulated of its kind, but we remember the case of a rapidly-growing girl who was certainly neither indolent nor emotional, but who suffered from headache, loss of appetite, &c., traceable, in our opinion, to the ill-directed work of one of the girls' public schools, where the subjects taught were far from high, but the method of learning enforced involved the maximum of distasteful labour. Three months' rest and change of scene, followed by a year at another school, which sends the most successful students to Girton and Newnham, and where cricket and football are among the recreations, worked wonders.

CUTTING OFF THE WATER SUPPLY.—On the 4th inst., a man, said to be employed by the sanitary authority, cut off the water supply from the inhabitants of Burradon, a colliery village near Newcastle. It has also been stopped at the neighbouring colliery of Westmoor. The reason alleged for this proceeding is that the authorities up to the present have failed to obtain the water-rate due from the owners of property to which water is supplied. The authorities would appear to be determined to force the water-rate from the occupier instead of the owner as decided in the Queen's Bench Division a short time ago. It is, however, dangerous policy to imperil the public health on any grounds whatsoever.

CORRESPONDENCE.

Audi alteram partem.

Communications must bear the signature of the writer, not necessarily for publication.

AWARDS FOR VENTILATION AT THE INTERNATIONAL HEALTH EXHIBITION, SOUTH KENSINGTON.

I read with great interest the correspondence and your valuable paper on the awards of the jury on at the International Health Exhibition. The honour of exhibiting, at Stand 467, South ventilator for sewers and hospitals for infectious, &c., also plans for the purification of water filtration. The ventilators were quite ready to which the jury might have thought fit to me. I received no intimation or notice, either jury or the officials, concerning any test or trial. When the jury visited the exhibit they took twelve each invention; the second time I was honoured by the jury I was requested to forward twelve each invention to the jury-room, together with remarks I thought might aid the jury in their decisions. I did so, and that is all I heard of the

publication of the correspondence of Messrs. Jones, and others, showing the method of testing, did not see that ingenious method of raising the lid by the jury. It would be so useful in a ; by so excellent a device you could at any rate create a current of air by giving a boy a copper handle. Would it not have been an improvement if the jury had fitted a penny whistle at the outlet of the pumps? then the jury could have both seen and ventilators at work! Truly 'when the cat is in the I.C.E. will play,' even with life and death. I regretted that such a controversy should have been a very grave question, and, with an annual from zymotic diseases of 100,000, it is a question of importance to the Commonwealth. 1885.

SAMUEL C. DEAN.

It is unfortunate that no official or authoritative description of the methods by which the tests are carried out has been published. Those interested are dependent for information upon the exhibitors who are present and the observers whose accounts vary. Messrs. Jones say that there is an easy way of testing the ventilators, but give no inkling of what it is. I will write some letters on the subject, for 'in the end the wisest of counsellors there is wisdom.' 1885.

EXPERIENCE.

ROCKETS' FOR TESTING DRAINS.

A little invention is being daily used by the members of the London Sanitary Protection Association, and by them to be of great assistance in their ink a description of it, with drawings, may interest to our brother sanitary engineers, and, if protected by any patent, they are welcome to it as they please. It is certainly not assumed its finished or final form (as they are improving upon it almost weekly), no doubt that improvements will suggest themselves to your readers; and if they first try them and then, if successful, describe them in your paper, they will confer a favour on the profession. The 'smoke-test' for drains and soil-pipes is

by no means new, but, as the general sanitary condition of dwelling-houses improves, the number of houses to which it is conveniently applicable increases, and it comes to be more and more used by sanitary engineers.

Every engineer called in to inspect and report upon the sanitary state of a house, about which he knows nothing beforehand, should go to it prepared to apply whichever of three tests may be found most suitable, or even to employ two or more of them in the same house, as is often found advantageous.

These three tests are the 'water-test,' the 'smell-test,' and the 'smoke-test.'

The usual method of applying the smoke-test has been to generate the smoke in a vessel on the surface of the ground, and then to pump it down into the drain to be tested; and I have no doubt many of your readers have been accustomed to use 'the asphyxiator,' which is advertised in your pages monthly, and a most excellently constructed and efficient machine it is.

The objection to it is that it is *heavy*. Both the generating vessel and the pump are necessarily heavy, so much so that the engineer cannot be expected to take them with him to houses unless he knows that he will be able to use them; and when he does take them they cost him a good deal in cab-hire, and necessitate his taking an assistant to work the pump. Seeing what an advantage it would be to us if we could get something lighter—something that the engineer could carry comfortably in one hand—our staff set their brains to work, and Mr. Burton, who has the advantage of being a trained mechanical engineer, succeeded in designing a machine which does all the work of the asphyxiator, and is less than a quarter of its weight, being all in one piece instead of in two.

He proceeded simply on the principle that drawing the hot smoke through the fan, which necessitates heavy castings for the fan and its case, is not necessary, and that a mixture of smoke and air could be driven into the drain without passing through the fan at all, which might then be made much lighter.

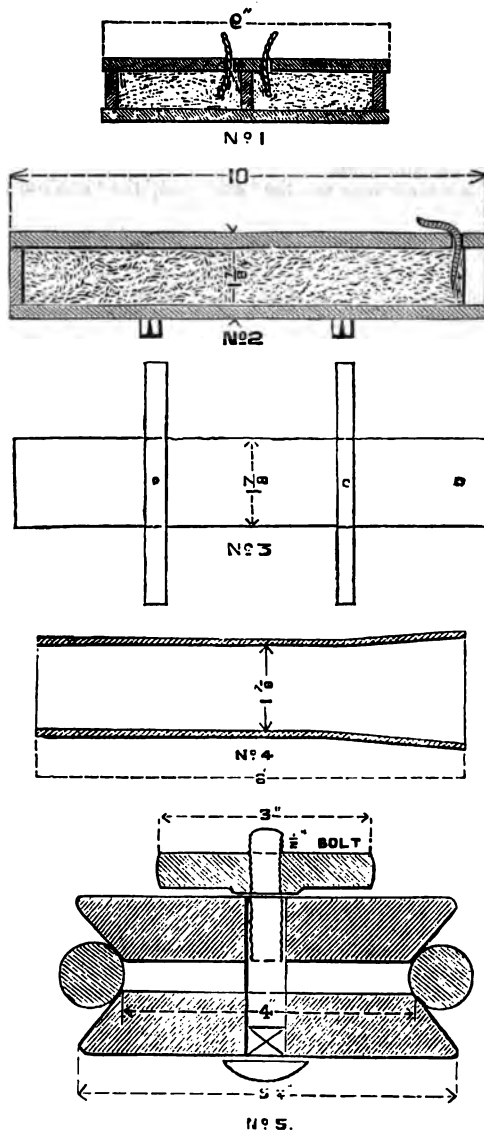
The machine was made experimentally from his drawings, and works well.

While he was designing this machine, my friend Mr. A. B. Brown, of Edinburgh, said to me one day, 'abolish your pump altogether, and burn a "rocket" in the drain.' Knowing as we do that a cubic inch of gunpowder, when set on fire, is converted suddenly into many cubic feet of gas, this appeared to me to be a workable idea. It was only necessary to mix some 'slowing' material with the gunpowder to prevent it being converted *suddenly* into gas (i.e. exploding), and to cause it to burn slowly, and it was further necessary that the 'slowing' material should be a smoke-producing material, which, when ignited by the gunpowder, should produce a dense smoke. This smoke would be carried forward by the invisible gases produced by the combustion of the gunpowder, and this mixture of invisible gases and smoke would soon displace all the air in the drain and pipes connected with it, and occupy its place.

The 'slowing' and 'smoke-producing' material, which first suggested itself to me, was powdered pitch; but at this point I handed over the practical carrying out of my ideas to Mr. James Pain, the eminent firework maker, of 1 St. Mary Axe, leaving him to select his own materials, and merely stipulating that he or his foreman should call upon us frequently while supplying the rockets in order that we might tell him of any difficulties that arose in the practical working and suggest modifications.

It will be seen from the drawings which I annex that the shape of the rocket has passed through very rapid changes; and Mr. Pain has also changed the composition several times, chiefly with a view to reducing its cost, and now tells me that he can supply the rockets—if ordered in considerable quantities—at the rate of one penny an inch, i.e. sixpence for a six-inch rocket (which burns for ten minutes, and is large enough for testing an average-sized house), and so on.

The drawings which I append are—



No. 1.—Longitudinal section of smoke rocket, as made December 15, 1884.

No. 2.—Longitudinal section of smoke rocket, as made February 15, 1885.

No. 3.—Plan of the above rocket, showing the cross-sticks which are attached to it for the purpose of forming a bridge inside the drain-pipe on which the rocket rests, clear of any sewage which may be in the bottom of the pipe.

No. 4.—Longitudinal section of a metal tube, which it is found advantageous to affix to the rocket to kill the flame and make it smoke. It will occur to everyone that the tube may be lengthened and bent into any shape to facilitate the introduction of the smoke.

No. 5.—Three views of a 'drain-plug,' which it is sometimes, but by no means always, found advantageous to use with the smoke-rocket. It will also be found very useful in applying the water-test. It is made and sold by Mr. Botting, of 6 Baker Street.

Believing that the 'smoke-rocket' is correct in principle, though by no means perfect in its details, and

that, even in its present form, it will be found useful by sanitary engineers, I venture to send you the above description of it, and shall probably write to you again in two or three months, describing the improvements that have been made in it in that time, and if any of your readers who tries it is able to suggest any improvements, either to me or Mr. Pain, he will find me very grateful, and Mr. Pain both grateful and willing to carry out the improvements in practice.

The demand for the 'rocket' appears likely to be very large, for our engineers find it so useful that they use two or three a day each, and as there are four of them, that indicates a consumption of eight or ten per day for our association alone, and as there is an association equal to ours in Edinburgh, and others not much smaller in Glasgow, Dublin, Liverpool, Bradford, Newcastle, and a dozen other towns, not to speak of all the sanitary engineers in private practice, I tell Mr. Pain that if he can make the things cheap enough, and working quite smoothly and certainly, he will sell many thousands in the year.

COSMO INNES, M. Inst. C.E.,

Sec. Lond. San. Protec. Assoc.

1 Adam Street, Adelphi, W.C.

A NEW DEPARTURE IN HOUSE DRAINAGE.

Will you permit me to reply to the letters of Messrs. Alexander, A. Kyd, and H. Masters, printed in the last number of the SANITARY RECORD.

I have not had the advantage of seeing the diagram of 'the double check system of house drainage,' referred to by Mr. Masters, but, judging of the system by the account which he has sent to you, I think it is clear that his arrangement differs materially from that which I have described.

I have to thank Mr. Kyd for the friendly tone of his letter. As to the model by-laws which he refers to, the Local Government Board allow the arrangement (b) only where another arrangement (a) is impracticable. And this arrangement (b) is suggested, as expressly stated in the annotated edition of the by-laws, 'to meet cases where the building actually abuts upon the street in front, and consequently has no forecourt or area of any kind.'

By the arrangement (b) an untrapped opening at the upper end of the drains is required. I suppose most persons will agree with me that this is a most undesirable thing; it is not found in my arrangement, and to my mind constitutes by itself a very important difference between the two systems.

It is required also by (b) that the soil-pipe should connect with the drains without the intervention of any trap, and it is permitted that the soil-pipe may, if of suitable size, &c., take the place of the front ventilating pipe. So by this arrangement the foul air of the drains is allowed to ascend the soil-pipe past the connection of the w.c. This is clearly shown in Mr. Rogers Field's illustration (No. 20) to the annotated edition of the model by-laws.

Now this is the exact opposite of what I advocate; instead of laying on foul air to the house I drive it away from it. I think then that the arrangement (b) which is only permitted in certain cases is but a feeble and half-hearted step in the direction of my suggestion, and is, if I may say so, a very undesirable arrangement, halting as it does between two systems.

As to trapped wastes joining the soil-pipe, I did not think it necessary to disconnect them, and for the following reasons. I applied the severest tests I could by means of the w.c., and utterly failed in the attempt to syphon out the waste-traps; and I was convinced that if the traps were emptied there would always be a current of air passing from the house down the waste-pipe. The inspection holes which Mr. Kyd refers to added but little to the expenditure, and personally I think they are worth their cost. An engineer may design an admirable arrangement of drains, &c., may see them properly carried out and leave them in excellent working order; but, nevertheless,

it still remain to some extent at the mercy of careless, or mischievous servants, and therefore desirable that, as modern drains once laid are immovable, there should be means provided for them readily at all important points.
D. J. EBBETTS.
1885.

December number there is an interesting article by J. Ebbetts on 'A New Departure in House Drainage' and I should like to try the plan, but find that the author omitted to say how the heights of the inlet pipes at outlet or extract flue compare, that is, he does not say how high he carries the soil-pipe on the north side, simply up to the gutter or higher? Is there any advantage in overing to the soil-pipe? In a case where the cistern is not available, for want of waterworks, is the system answer? If the author will kindly clear matters he will confer a favour on
F. P. GRANDIN.

gent Road, Jersey, Jan. 16.

experiments made I should say that the relative heights of the soil-pipe and ventilation-pipe are of no importance so long as the ventilation-pipe is slightly above the soil-pipe.

level or fitting on the soil-pipe would be of any advantage unless it were an 'inlet cowl,' and there is really no need of one.

ing cistern is of less necessity with the system I described than with any other system, but they are valuable in keeping the drains clean. Wherever a cistern is used, surely a flushing cistern can also be used. A thirty-gallon cistern, discharging once in every four hours, would be sufficient for most houses, and can be fed by a rain-water pipe, or better, a small cistern, with a branch from the water-closet to be used in dry weather.—D. J. EBBETTS.]

the idea of trapping and ventilating house-drains decried by Mr. D. J. Ebbetts in your December issue is neither is it a first-class style. I look upon it, done it, as a second-rate way of executing the plan which will be seen illustrated in fig. 22 of my March 22, 1883, while Mr. Beattie, plumber, of Edinburgh, also published the plan several months ago. Professor Fleming Jenkin also published a plan in 1878 in which the foul air would blow off at a level when the closets were let off.

however, always looked upon direct communication between the soil-pipe and the drain as an inferior way of doing the work; hence, in my Patent of July 9, 1868, the house-drain is shown ventilated by high-level and high-level outlet quite independent of the soil-pipe.

In some cases the ventilating-pipe for the trap may be of the soil-pipe may be carried as high as the level of the soil-pipe is needed. When both pipes are on the roof it matters little which is the inlet and which is the outlet, and if the soil-pipe is inside the house and the ventilating-pipe outside, then, when there is no rain, the air will go up the soil-pipe, except during the time a closet is running.

Ebbetts' 'new departure' is not a new idea, neither is it an improvement upon the best style of work as carried out by various plumbers for years back.—I am, &c.,
W. P. BUCHAN.
Feb. 7, 1885.

VENTILATION OF PUBLIC SEWERS.

Much has been said and written upon this subject, and it is little difficult to find sufficient unity of opinion to come to say that such and such is the most approved method. A very large number of towns ventilate their sewers by open gratings in the centre of the roadways, and it is very doubtful whether this is a very safe practice.

In some localities, by arrangement with property owners, ventilating shafts from the sewers are carried up by the chimney stacks of the adjoining houses. On one estate with which I am acquainted, by arrangement with the landholders, no gratings are to be placed in the streets, but ventilating flues connected with the sewers are to be built into the chimney stacks of the houses. Now I should be very glad if you, or some of your correspondents, can give an authoritative utterance on this vexed question. The points of importance are:—1. To what extent is there danger to the health of the inhabitants in the sewer air which escapes from the ventilating gratings in the public roads. 2. Is there not considerable danger to the occupants of any house having a ventilating shaft from the sewer, carried up near a chimney flue, from the sewer air being blown down into the rooms through the chimney flue.—Yours, &c.,
C. BOND.

PATENT CAST-IRON INSPECTION OR ACCESS-PIPES FOR HOUSE-DRAINS.

In your current issue I notice a letter from Mr. W. P. Buchan in reference to the above. It is unnecessary to trespass on your valuable space in reply further than to say that Mr. Buchan's device is in fire-clay, whereas my device is in cast-iron, and of a totally different construction. There appears to have been some little misapprehension, which I suppose must account for the letter in question.

G. C. DAVIES.

65 Lausanne Road, London, S.E.,
Jan. 31, 1885.

SANITARY JOTTINGS.

SEASONAL MORTALITY.—Some interesting details with regard to the rate of mortality in Scotland at various periods of the year are given in the last annual report of Dr. Cunynghame to the Registrar-General. Among children under five years of age the greatest mortality during the year was in the months of January and March. Among those between five years and twenty years of age the most fatal months were March, May, and June. Adults succumbed most numerous during January, in which month the death-rate reached its highest point for the year. The lowest death-rate was in September.

DISEASED MEAT.—Edward Ascough, a butcher, was charged before the stipendiary magistrate at Middlesbrough on the 26th ult. with having exposed for sale at the market place, Middlesbrough, on January 3, sixty-eight pieces of meat which were unfit for human food. From evidence in support of the charge, it appeared that the animal had suffered from wasting or lung disease which rendered the flesh unwholesome. The defendant was fined in the mitigated penalty of 15s., or, in default, six weeks' imprisonment.

THE INSPECTION OF DAIRIES.—At the Northumberland quarter sessions, held at Newcastle on February 5, the inspector reported that a dairyman's byre at Scotswood was found to be in an unsatisfactory state. It had in 1879 been licensed for four cows, but there had always been ten cows kept in it. Typhoid fever prevailed in the district; and in no less than eleven of the cases the patients received their milk from the dairy in question. The committee suggested that the chief constable should be instructed to co-operate with the local authorities in such matters as the cleansing of dairies and the punishment of offenders.

PERNICIOUS IGNORANCE.—As exemplifying one of the many instances that could be adduced, where sanitary officers meet with opposition where they may reasonably expect support; at the last meeting of the Darlington Rural Sanitary Authority a member sagely delivered his

views on the uselessness of drainage generally, and stated his candid opinion—that if there had not been any system of draining inaugurated in this country it would have been as healthy as it is now. This gentleman would, doubtless, have approved of the lodgings where the landlady received complaints of bad smells, by the assurance that it could not be the drains, for there were not any.

M. Fordoz gives in *Cosmos* a very simple and useful method for detecting lead in the tinning of culinary utensils. The vessel being carefully cleaned to remove grease, a drop of nitric acid is applied to any part, and a gentle heat is used to dry the spot. A drop of solution of iodide of potassium is applied to the spot, and if lead be present a yellow iodide of lead is formed.

WATER SUPPLY.

THE NEW WATERWORKS AT KENILWORTH.—Some years ago a scheme for providing the town of Kenilworth with a good unlimited water supply was started by a company in London, and shortly afterwards was taken up by local directors, who then carried the scheme out. The works, which were opened early in the year, are situated on the road leading from Coventry to Kenilworth. The water supply is obtained from a sandstone hill, into which an adit (5 feet in width and 16 feet deep) was driven for a distance of 275 feet. Underground chambers have been constructed for the storage of the water, and a pumping station erected, which contains two 12 horse-power gas engines. The supply is estimated at from 12,000 to 16,000 gallons per hour; and the water is raised to the top of a tower on Tentor's Hill, from which the town is supplied by gravitation. This tower is some 60 feet in height, and has at the top a storage-tank capable of holding 27,000 gallons. The town is fed by means of four and three inch mains, connected with which are seventy-five hydrants and seven fountains, in addition to stand-posts, &c., for general supply. The total cost is stated to be 8,500*l*.

In consequence of the unsatisfactory character of the water supply to Newcastle and Gateshead, a project has been mooted for the Corporations of these towns to purchase the interests of the present water company in order that the ratepayers may be able to deal more effectually with this important question.

At the last meeting of the York Rural Sanitary Authority, Mr. J. F. Marshall, the medical officer of health, presented an exhaustive report relative to the water supply of Bishopthorpe, to which the attention of the board had been forcibly drawn at a previous meeting. It appears that the water-supply of the village is almost wholly derived from wells, of which a large number were contaminated in a greater or less degree by the percolation of impure surface water and sewage matter. Thirty-two samples of water were analysed, and it was found that the better-class houses had the best water, from the general cleanliness of their surroundings; but, without exception, the whole of the cottagers' wells were polluted, and gave a very undesirable supply, whilst some are positively dangerous to health. The report is accompanied by an interesting tabular analysis of the quality of various samples of water examined.

SEWERAGE.

MAIN DRAINAGE WORK IN THE BIRMINGHAM DISTRICT.—The report of the work done by the Birmingham Tame and Rea District Drainage Board last year, presented at the annual meeting held a short time since, shows they are making satisfactory progress with the important and extensive operations under their control. Their expenditure last year was close upon 30,000*l*., bringing the total sum expended by them on drainage works which affect the boroughs of Birmingham, Aston Manor, Balsall Heath, Smethwick, Harborne, Handsworth, and Saltley Local Board districts, &c., to 386,000*l*.. This represents a capital outlay of something like 13*s*. per head of the population embraced by their operations. The

work is not yet completed, however, and will by that time have cost something like 400,000*l*.. They have, however, 900 acres of freehold land, which is increasing in value for sewage farms and other purposes, and above 10,000*l*. worth of live stock. The chairman (Mr. Alderman Avery) claims that the purification works and system employed by the Board are entirely successful in operation. They are now engaged in carrying out the recommendations of the Birmingham Sewage Inquiry Commission of 1871, viz. that the sewage should be precipitated in tanks and the acids neutralised by means of lime, its ultimate purification being effected by means of land irrigation. The advantage of this combination was found to be that one acre of land after precipitation was found to be as effective as six or eight acres without it. In July last the late Dr. Voelcker, in giving evidence before the Lower Thames Valley Sewerage Board, said, respecting the scheme carried out in the Birmingham district, that 'the construction of the tanks, the precipitating agents used, and the whole care with which the process of precipitation and purification is carried out, are so perfect that even dealing with this mass of sewage, not the slightest inconvenience is felt, and no complaint, to my knowledge, has been made since the construction of the precipitating works.'

The Royal Commission on Metropolitan Sewage Discharge, of which Lord Granville was chairman, had also reported respecting the Birmingham scheme that 'On the whole we consider this plan offers one of the most feasible means of solving the difficulty.' At the Saltley Sewage Farm a daily produce of milk is realised, amounting to 135 gallons, which, it is estimated, will shortly be increased to 200 gallons, and there are six silos in operation. The quality of the ensilage has not yet been ascertained.

THE HOUSING OF THE WORKING CLASSES.

*'How best to help the slender store,
How mend the dwellings of the poor!'*

IN his evidence before the Royal Commission on the Housing of the Labouring Classes, the Earl of Shaftesbury stated his opinion that the Labouring Classes' Lodging-houses Act of 1851 would meet almost everything that is required at the present moment, whereas, in point of fact, it has been a dead letter. But the Commons Lodging-houses Act of the same year has been very largely applied all over England, and is very largely in operation in the metropolis. Lord Shaftesbury estimates that every night in London there are from 20,000 to 30,000 people sleeping in houses under that Act; and both in the metropolis and in the other great towns the physical and moral benefits have been most satisfactory. A very large proportion of the population of London live in single rooms. The evil of overcrowding has increased very much of late years, owing to the large displacement of the population for the making of new streets, and the Thames Embankment and the Law Courts, and all the general improvements throughout London. The population were overcrowded before, but now they have become overcrowded to an extent never before known. When, for instance, the rookeries which were on the site of New Oxford Street were cleared away, the population flowed over into Church Lane and the adjacent streets, and the houses, which were then overcrowded, became crowded to such an extent that it was impossible for the people to live in them with any hope of health or decency. Then, again, when the clearances took place at Westminster in the year 1866 the overcrowding became excessive, and it was very hard indeed for the poor people. Lord Shaftesbury explained to the Royal Commission that he went over the houses himself, and had the statement from the occupants' own lips that many of them having too

oms were compelled by their landlords to take one room, and to pay exactly the same rent for the one room that they had formerly paid for the two rooms. A great many are driven across the river, but that involved very serious calamities to the poor people who had to live such a distance from their work, or form new relations of labour in the districts to which they fled. Besides the evil of the crowding of poor families in single rooms, his lordship stated that he had known many cases where lodgers were taken in well. He saw once four distinct families in one room, each occupying a corner. The state of the houses thus occupied may be gathered from the fact that when the workmen began to pull down parts of the houses in Tyndall's Buildings, Gray's Inn Road, the swarms of vermin were so great that there was a strike; and the workmen, though accustomed to their task, would not return until fire-engines had been introduced, charged with water, which destroyed the animals and pumped them out of existence. Lord Shaftesbury's experience of the lives of the very poor in London has been extensive and peculiar, and he has furnished the Royal Commission with many striking and painful incidents. Speaking of Frying-Alley, a famous purlieu of Holborn, his lordship says:—"In the first house I turned into there was a single room. The window was very small, and the light came through the door. I saw a young woman there, and I asked her if she had been there some little time. 'Yes,' he said, 'my husband goes out to work, and is obliged to come here to be near his work.' She added, 'I am miserable.' 'What is it?' I asked. 'Look there,' she replied, 'at that great hole. The landlord will not mend it. I have to sit up every night and watch, or my husband does so, because that hole is over a common sewer, and the rats come up, sometimes twenty at a time, and if we did not watch for them they would eat the baby up.'" Speaking of a visit to a low cellar in Tyndall's Buildings, his lordship says:—"There was not so much wood in it as would make a faggot. There were a woman and two children there, and from a hole in the ceiling there came a long open wooden trough, supported by props, and from that flowed all the filth of the house above into the common sewer. Nobody paid the least attention to it." The evidence taken by the Royal Commission on the Housing of the Working Classes points to a considerable change in the prejudices of the labouring population of the metropolis in relation to barrack dwellings. Lord Shaftesbury stated to the commission that those classes would now go as readily to the great blocks of houses as into small houses. For long time there was the greatest desire in London and her large towns that every man should have in his own house his own castle. But in London this is impossible, and now so far from there being reluctance to go to the large blocks Lord Shaftesbury says he has found a model lodging-house people will pay 1s. more a week to get a little higher up in order that they may get a better air and a better view. He has no doubt that if many of these houses were constructed in many stories in order to save land, the people would go into them most readily. In reply to Sir Richard Cross, Lord Shaftesbury said that while there were a great number of people who live in the worst houses on account of the need to be near their work, there were a great number who might just as well live elsewhere. Many more might, and would, go into the suburbs were railways a little more liberal and more convenient in their running of trains. He said how he would deal with the very lowest class—the rat class—in London and in other great towns, his lordship admitted that he had never been able to see any mode, except by a complete alteration of the state of society, in which they could be benefited. They were always moving about from place to place in search of work. They rarely remained more than three months in the same place. This was not a class of people who could afford to go into the Improved Dwellings, and if they went there their habits were such that they would make the buildings

as bad as the places they had left. Asked whether he could make any suggestion to the Commissioners as to the best way of dealing with that lowest class, his lordship replied that he had not a notion what to do with them.

NEW ARTISANS' DWELLINGS IN LAMBETH.—A block of buildings for the industrial classes has just been erected in Walnut Tree Walk, off Kennington Road, Lambeth. The buildings, which are in two blocks, have a frontage to Walnut Tree Walk 40 ft. in length, and extend to a depth of 100 ft. They contain four floors, and are 50 ft. in height. The elevation is faced with white Suffolk brick, and the frontage is ornamented with moulded and cut brick panels by Mr. James Brown, of Finsbury. The keystones, copings, and finials are in Portland stone. Each floor contains four sets of apartments, in suites of three rooms each, consisting of living-room, bedroom, and kitchen, with separate water-closets to each suite. The living-rooms are fitted with two cupboards, and there is one in each of the bedrooms, whilst the kitchens, in addition to dressers and cupboards, are supplied with coppers, sink, and coal bunker. There are stone staircases from the ground to the upper floor. The open flat roof, which is intended for both drying and recreation purposes, is constructed of concrete slabs and cement, and enclosed by a parapet wall 4 ft. in height. Messrs. Stock, Page, & Stock, of Duke Street, London Bridge, are the architects, and Messrs. J. Ford & Sons, of Denmark Hill, are the contractors. The cost of the buildings, which have been erected for Mr. Mackenzie, is 4,000/.

Prof. Felix Adler recently delivered a lecture on 'The Tenement-House Question,' at Chickering Hall, New York, U.S.A., in which he said that the greatest evil was overcrowding, and that he knew where a man lives with his wife, children, and nine boarders in two small rooms. He said that the law which allows 600 cubic feet of air to every human being is persistently violated. He thought that steps should be taken in New York, similar to those in London, where 12,000,000 dollars were being collected for the purpose of erecting houses for 50,000 human beings on 42 acres, and that the public baths should be kept open during the winter.

OVERCROWDING IN NEW YORK.—A medical commissioner of the *New York Tribune* is publishing in that journal the results of examinations he has made into the condition and dwellings of the poor of New York. In a recent article he refers to the extraordinary growth of tenement-houses. Although the first tenement was erected about 1838, by the year 1865, when a sanitary census was taken, there were 15,309 tenements on Manhattan Island. In 1879 their number had increased to 21,163, and in 1883 to 25,663, including apartment houses and flats. The average number of inmates in each tenement in 1864 was 35; but in 1864 houses inspected last summer by the Tenement-house Commission there were 8,811 families and 37,114 persons, or an average of 40 tenants to each house. In 1864 it was estimated that half a million persons lived in tenements; now the number is not far short of a million. But there are also hundreds of small buildings which possess all the attributes of tenements, and which are lacking in sanitary needs. There are 17,615 wooden buildings on Manhattan Island occupied as dwellings or as lodging-houses, and there are 29,000 buildings used partly for business purposes and partly as residences. Striking a comparison between number of houses and population, it appears that the average number of inmates per house in the principal American cities is as follows: Philadelphia, 6; Brooklyn, 9; St. Louis, 8; Chicago, 8½; Baltimore, 6½; Boston, 8½; and New York, 16½. But other facts show an unexampled crowding of population in New York. Of the total number of dwellings in that city, 10,314 contain one family, or six persons, including domestics; 16,982 houses or flats contain one family on a floor, or 25 persons; while 18,966 tenements accommodate 50 persons each on an average, or almost 1,000,000 persons. Moreover, large sections of the city

are covered with houses standing so close to each other as hardly to permit air or light to gain access to the lower rooms. There are no fewer than 2,500 rear tenements separated by yards rarely more than twelve or fifteen feet from the front houses, while in many cases the space is not half that amount. Only radical measures can remedy the evil. There were 720 rear tenements examined, which abutted directly upon each other, and in these dwellings there were not less than 20,000 persons, bereft of sunlight and air.

A resident in the Barn-close district, Gateshead, was recently removed to the Gateshead Fever Hospital suffering from a very severe attack of typhus. When the medical officer was investigating the cause of the outbreak in this locality he found that the patients had been living in the basement of a house belonging to a paid servant of the Gateshead Corporation, and on removing a portion of the floor he discovered a mass of stagnant sewage matter, which had leaked from defective drains. Unfortunately horrors of this kind are by no means uncommon, and are not always so promptly discovered and rectified.

PARKS AND OPEN SPACES.

*The law condemns both man and woman
Who steals the goose from off the common;
But lets the greater felon loose,
Who steals the common from the goose.*

THE Parks Committee of the Newcastle Corporation have recommended the purchase of 12½ acres of land adjoining the present Elswick Park for extending the same. The committee suggest that a considerable portion of the purchase-money could be recouped by the sale of a small portion of the site for building purposes.

The Paving and Drainage Committee of the Tunbridge Wells Local Board and Urban Sanitary Authority reported at the last meeting of the board that they had received a most generous offer to present to the town, free of cost, a piece of land containing not less than four acres, on condition that a piece of land adjoining and belonging to the board should, together with the above-named four acres, be devoted entirely for a public recreation ground. The offer was accepted.

NOTICES OF MEETINGS.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

T. O. DUDFIELD, M.D., President.

THE next meeting will be held on Friday, Feb. 20, at 7.30 P.M. A paper will be read on 'Sewer Ventilation and House Sanitation,' by Mr. William Weaver, A.M.I.C.E., Surveyor to the Vestry of Kensington.

SHIRLEY F. MURPHY,
C. E. SAUNDERS, M.D.,
Hon. Secretaries.

1 Adam Street, Adelphi, London.

VACCINATION OFFICERS' ASSOCIATION.

THE special and annual meeting of members of this Association will be held on Saturday, Feb. 21, at 2.30 P.M., at the Charing Cross Hospital Medical School, 62 Chandos Street, Strand, W.C. Business:—1. To read minutes of last meeting. 2. Correspondence. 3. Report of Committee, re insusceptibility. 4. Election of members and honorary members. 5. To submit annual report and balance sheet. 6. To consider the alteration of rules. 7. To elect executive officers and committee for the ensuing year.

C. P. ELKERTON, hon. secretary,
20 Clarendon Street, Pimlico, London, S.W.

WE understand that amongst the recent additional medical inspectors appointed by the Government, is Mr. R. J. R. Sweeting, of the Western Fever Hospital, Fulham, who is at present making inquiry into the prevalence of fever and diphtheria at Normanton and other places in Yorkshire.

APPOINTMENTS.

MEDICAL OFFICERS OF HEALTH.

- ATKINSON, Thomas Reuel, M.R.C.S.Eng., L.S.A.Lond., has re-appointed Medical Officer of Health for the Madley D of the Dore Rural Sanitary District, Herefordshire, at one year, *vice* Lane, resigned.
- BERSFORD, Robert de la Poer, M.D.Univ.Glasg., L.R.C.P has been re-appointed Medical Officer of Health for the O Urban Sanitary District, at £25 for one year.
- CARROLL, Dr. Joseph, has been appointed Medical Officer of for the Ilkeston Urban Sanitary District, at £30 per annum Cooper, deceased.
- CURTIS, Albert, M.R.C.S.Eng., L.S.A.Lond., has been re-ap Medical Officer of Health for the Staines Urban Sanitary I at £21 for one year.
- EVANS, Thomas, M.D.Univ.Edin., L.R.C.S.Edin., has b appointed Medical Officer of Health for the New Quay Sanitary District, Cardiganshire, at £5 for one year.
- FREER, John Henry, L.R.C.P.Lond., M.R.C.S.Eng., ha re-appointed Medical Officer of Health for the Rugeley Sanitary District, at £20 per annum for three years.
- LE TALL, Frederick Tindall, M.R.C.S.Eng., L.S.A.Lond., h re-appointed Medical Officer of Health for the Hand Urban Sanitary District, Yorkshire, at £20 for one year.
- LLOYD, William Howell, M.R.C.S.Eng., L.S.A.Lond., ha re-appointed Medical Officer of Health for the Llandilo Sanitary District, Carmarthenshire, at £10 for one year.
- LOWE, Alexander, M.B., C.M.Univ.Glasg., has been ap Medical Officer of Health for the Llanelly Division of the howel Rural Sanitary District, at £25 per annum, *vice* shire, resigned.
- MONTGOMERY, Samuel, L.R.C.P.Edin., L.R.C.S.Edin., ha appointed Medical Officer of Health for the Ovenden Sanitary District, Yorkshire, at £25 per annum for five from March 25, 1885.
- PAGET, Charles Edward, L.R.C.P.Lond., M.R.C.S.Eng Medical Officer of Health for the combined Sanitary De has been appointed Medical Officer of Health for the i formed Ambleside Urban Sanitary District, at £16 per ann
- POWELL, John, L.S.A.Lond., has been re-appointed Medical of Health for the Kentchurch Division of the Dore Rural tary District, at £17 for one year.
- RENDALL, John, L.R.C.P.Lond., F.R.C.S.Eng., L.S.A.Lond been re-appointed Medical Officer of Health for the Lyms Urban Sanitary District, at £30 for one year.
- ROCH, Sampson, M.R.C.S.Eng., has been appointed Medical of Health for the Cheltenham Urban Sanitary District, at per annum, *vice* Wright, deceased.
- SAUNDERS, William Sedgwick, M.D., L.R.C.P.Edin., has be appointed Medical Officer of Health and Public Analyst City of London, for one year.
- SCOTT, Thomas, M.D.Univ.Edin., L.R.C.S.Edin., has be appointed Medical Officer of Health for the Ilkley Urban tary District, at £30 for one year.
- THAIN, Leslie Lachlan, M.R.C.S.Eng., L.S.A.Lond., has be appointed Medical Officer of Health for the Longtown Di of the Dore Rural Sanitary District, at £17 for one year.
- TODD, George, L.R.C.P.Edin. and L.M., L.R.C.S.Edin., ha appointed Medical Officer of Health for the Brigg Sanitary District, at £10 per annum, *vice* Palmer, resigned
- WALKER, John Davidson, L.R.C.P.Edin., L.R.C.S.Edin been re-appointed Medical Officer of Health for the Ki Urban Sanitary district, at £30 for one year.
- WARTENBERG, Victor Adolph, L.R.C.P.Edin., M.R.C.S L.S.A.Lond., has been re-appointed Medical Officer of for the St. Anne's-on-the-Sea Urban Sanitary district, at one year.
- WILLIAMS, William, M.D.Univ.St.And., M.R.C.S.Eng., Lond., has been re-appointed Medical Officer of Health Mold Urban Sanitary District, at £25 for one year.
- WRIGHT, Alfred, M.R.C.S.Eng., L.S.A.Lond., has been re-ap Medical Officer of Health for the Romford Rural Sanita trict at £100, and for the Romford Urban Sanitary Dis £25, both for one year.

SURVEYORS, CLERKS TO GUARDIANS, INSPECT NUISANCES, &c.

- AINGE, Mr. Thomas Styles, has been appointed an additi spector of Nuisances for the Bristol Urban Sanitary Dis 35s. per week.
- ASHCROFT, Mr. Thomas, has been appointed Inspector of N for the Preston Rural Sanitary District, at £100 for one y School Attendance Officer, at £50 per annum, from year *vice* Chadwick, whose appointment has expired.
- BALDWIN, Mr. Edmund Chaplin, has been appointed a Coll the Brighton Town Council and Urban Sanitary Auth £150 per annum, *vice* Smithers.
- BEALE, Mr. F., has been elected a Member of the Barkin Local Board and Urban Sanitary Authority, *vice* I resigned.
- BELLAMY, Mr. James William (the Clerk), has been appoint veyor to the Rawmarsh Local Board and Urban Sanitary rity, Yorkshire, *vice* Train, resigned.

Ernest Frederick, has been appointed a Collector to the Town Council and Urban Sanitary Authority, at £150 m. *vice* Merrick.

Mr. William Henry, has been appointed Surveyor to the Town Council and Urban Sanitary Authority of Bolton, at £100 m. *vice* Proctor.

W. H. M., has been elected a member of the Sherborne Local Board and Urban Sanitary Authority, *vice* Miller.

Mr. William, has been re-appointed Inspector of Nuisances to the Loughborough Urban Sanitary District, Yorkshire, at £10 m.

Ambrose Wootton, the surveyor to the Loughborough Urban Sanitary Authority, has been appointed Surveyor under the Canal Boats Act, 1877.

Thomas, has been re-appointed Inspector of Nuisances to the Loughborough Urban Sanitary District, Cardiganshire, at £10 m.

J. T., Branch Manager of the London and Provincial Assurance Corporation, has been appointed Treasurer to the Woolwich Local Board and Urban Sanitary Authority, *vice* Morgan.

Mr. Daniel, has been re-appointed Inspector of Nuisances to the Loughborough Urban Sanitary District, at £80 for the year ending March 25, 1886.

William Berry, has been appointed Town Clerk and the Urban Sanitary Authority of Maidenhead, *vice* deceased.

George, has been appointed Clerk to the newly formed Local Board and Urban Sanitary Authority, at £30 m.

Mr. William, has been appointed Collector to the Sandal Board and Urban Sanitary Authority, at £40 per *vice* Brickman.

Mr. Joseph, has been appointed Surveyor and Inspector of Nuisances to the Leominster Urban Sanitary Authority, at £50 for two years, *vice* Cox, deceased.

Henry, has been appointed an additional Inspector of Nuisances to the Bristol Urban Sanitary District, at 35s. per year.

Mr. John, M.A., has been appointed Clerk to the Hard-ward Guardians and Rural Sanitary Authority, Northampton, at £80 per annum as Clerk to the Guardians, and such remuneration as Clerk to the Rural Sanitary Authority, Assessment Committee, and to the School Attendance Committee, as may be fixed annually, and fees as Returning Officer, *vice* Jeffery, resigned.

William, has been re-appointed Inspector of Nuisances to the Loughborough Urban Sanitary District, at £17 for one year.

Mr. William, has been appointed Collector to the Swindon Local Board and Urban Sanitary Authority, at £2 m. until March 25 next, *vice* Mr. John William Jolliffe.

Frank Maude Taylor, J.P., has been elected Chairman of the newly formed Ambleside Local Board and Urban Sanitary Authority.

Mr. Isaac, has been re-appointed Inspector of Nuisances to the Loughborough Urban Sanitary District, at 25s. for one year.

Thomas Joseph, has been appointed Collector to the Loughborough Local Board and Urban Sanitary Authority, at £115 m. *vice* Wager, deceased.

Mr. Henry, has been re-appointed Inspector of Nuisances to the Henley Urban Sanitary District, at £60 per year or three years.

Tom K., has been appointed Assistant Inspector of Nuisances to the Halifax Urban Sanitary District, at 35s. per year uniform.

Mr. George Somers, has been re-appointed Surveyor and Inspector of Nuisances to the Dorking Local Board and Urban Sanitary Authority, at a joint salary of £190 per annum, for three years.

Mr. Joseph, has been re-appointed Inspector of Nuisances to the Loughborough Urban Sanitary District, at £30 per annum, for 5 years, from March 25, 1885.

A. E., has been elected a member of the Usk Local Board and Urban Sanitary Authority, *vice* Hart, deceased.

Mr. John, has been appointed Surveyor of Buildings and Inspector of Nuisances for the Wavertree Urban Sanitary District, at £120 per annum, *vice* Wits, appointed Surveyor and Inspector of Nuisances to the Skelton and Broton Local Board and Urban Sanitary Authority.

R. F. B., has been elected a Member of the Hadleigh Local Board and Urban Sanitary Authority, *vice* Hart, deceased.

Mr. John Henry, has been appointed Inspector of Nuisances to the Loughborough Rural Sanitary District, at £125 per annum, from year to year, *vice* Cockrell.

John, has been elected Chairman of the Depwade Local Board and Rural Sanitary Authority, Norfolk, *vice* King.

Mr. R., has been appointed Treasurer to the Aberystwith Local Board and Rural Sanitary Authority, *vice* Jones, deceased.

William, has been re-appointed Inspector of Nuisances to the Loughborough Urban Sanitary District, at £20 for one year.

Hugh, has been appointed an additional Inspector of Nuisances to the Bristol Urban Sanitary District, at 35s. per year.

Mr. William Henry, has been appointed Inspector of Nuisances to the Pottersbury Rural Sanitary District, Northampton, at £50 per annum, *vice* Gilkes, deceased.

SMITH, Mr. J. Campbell, has been appointed Surveyor to the Town Council and Urban Sanitary Authority of Bury St. Edmunds, at £250 per annum, *vice* Hague, who was appointed, but continues as Surveyor to the Buxton Local Board and Urban Sanitary Authority, at an increased salary.

SUTCLIFFE, Mr. Alfred, has been appointed Surveyor and Inspector of Nuisances, for the Thornton Urban Sanitary District, at £78 per annum, *vice* Howard, deceased.

TICEHURST, Mr. Frederic Gorham, has been appointed Clerk to the Battle Guardians and Rural Sanitary Authority, at £125 per annum as Clerk to the Guardians; £40 per annum as Clerk to the Rural Sanitary Authority; £50 per annum as Clerk to the Assessment Committee; £40 per annum as Clerk to the School Attendance Committee; and fees as Superintendent Registrar of Births, &c., and Returning Officer, *vice* Mr. Francis William Ticehurst, resigned.

TYRER, Mr. J., has been elected a Member of the Malvern Local Board and Urban Sanitary Authority, *vice* Smith, resigned.

WAKEFIELD, CREWSON, & Co., Messrs., Bankers, have been appointed Treasurers to the newly formed Ambleside Local Board and Urban Sanitary Authority.

WILLIS, Mr. Thomas Price, Solicitor, has been appointed Clerk to the Winslow Guardians and Rural Sanitary Authority, at £70 per annum as Clerk to the Guardians; £20 per annum as Clerk to the Rural Sanitary Authority; £10 per annum as Clerk to the Assessment Committee; such salary as Clerk to the School Attendance Committee as may be fixed from time to time, and fees as Superintendent Registrar of Births, &c., and Returning Officer, *vice* Mr. David Thomas Willis, deceased.

PUBLIC ANALYSTS.

BERINGER, Mr. John Jacob, has been re-appointed Public Analyst for the borough of Penryn for one year.

EMERY, Mr. George, has been appointed Public Analyst for the county of Gloucester at £100 per annum, and £15 for chemicals and a laboratory (subject to confirmation at the Easter Quarter Session) *vice* Horsley, resigned.

JONES, Mr. E. W. T., has been re-appointed Public Analyst for the Borough of Walsall, at £50 for 1 year, and £2 2s. per day when required to give evidence.

YOUNG, Mr. W. C., has been re-appointed Public Analyst for the Whitechapel District, for one year.

VACANCIES.

MEDICAL OFFICER OF HEALTH for the Lowestoft Urban and Port Sanitary Districts: £110 per annum. Application to the Clerk to the Improvement Commissioners.

MEDICAL OFFICER OF HEALTH for the Mutford and Lothingland Rural Sanitary District: £60 per annum. Application to the Clerk to the Guardians, Lowestoft.

MEDICAL OFFICER OF HEALTH for the Hursley Rural Sanitary District: £25 per annum (in addition to £100 per annum and fees as Poor-law Medical Officer, if the same person should be appointed, as hitherto). Application, 17th inst., to Rev. J. F. Moore, Ampfield Vicarage, Romsey, Chairman of the Board of Guardians.

TOWN CLERK and CLERK to the Urban Sanitary Authority of Huddersfield (a Solicitor): £800 per annum clear, with offices and clerks. Application, 28th inst., to G. Lewis Batley, Town Clerk *pro tem*.

CLERK to the Rotherham Guardians and Rural Sanitary Authority. SURVEYOR to the Hendon Local Board and Urban Sanitary Authority: £150 per annum. Application, 21st inst., to Samuel Tilley, Clerk.

SURVEYOR and INSPECTOR OF NUISANCES for the Wilton Rural Sanitary District: £105 and £60 per annum. Application, 19th inst., to George M. Wilson, Clerk to the Authority, 12 Bridge Street, Salisbury.

SURVEYOR to the Ambleside Local Board and Urban Sanitary Authority. Application to Mr. George Gatey, Clerk.

INSPECTOR OF NUISANCES for the Newbury Rural Sanitary District. COLLECTOR to the Ambleside Local Board and Urban Sanitary Authority.

LOCAL INTELLIGENCE.

Dr. A. Bostock Hill, Public Analyst for Coventry, in his last report stated that the Sale of Food and Drugs Act had almost fallen in abeyance in that city. Only one sample of milk had been submitted to him for analysis during the quarter, and that was found to be genuine.

The Rev. John Mackie, Rector of Fylton, in his New Year's address to the congregation, stated that the last death in the parish, with a population of about 300, was that of a person aged upwards of eighty, in June 1883.

Mr. E. B. Ellice Clark, M.I.C.E., Engineer and Surveyor to the Hove Improvement Commissioners and Urban Sanitary Authority, has been appointed County Surveyor for West Sussex.

At the meeting of the Town Council and Urban Sanitary Authority of Warwick, Dr. A. Bostock Hill, Borough Analyst, reported that during the quarter ending Dec. 31, five samples of milk were sub-

mitted to him for analysis by Inspector Trepess. Of these one was adulterated with 11 per cent. of added water, while another had been deprived of its cream to the extent of 35 per cent. The three other samples were genuine, and of good quality. The Mayor, in answer to Alderman Moore, said that in the first two cases there had been convictions, a fine of £5 being imposed in one instance.

Dr. Edward Jeffery, the Medical Officer of Health for the Lowestoft Urban Sanitary District, was seized with a fit on Saturday, Jan. 17, and expired almost immediately.

The extraordinary number of 354 applications were made for the appointment of Assistant Sanitary Inspector for the Halifax Urban Sanitary District, at 35s. per week, with a suit of uniform.

Mr. Joseph Hague, upon being appointed Surveyor to the Town Council and Urban Sanitary Authority of Bury St. Edmunds, as mentioned in p. 543, sent in his resignation to the Buxton Local Board and Urban Sanitary Authority, when the latter, stimulated by memorials from the ratepayers, offered to increase his salary £100 per annum, if he would remain for three years, which he agreed to do.

The Todmorden Local Board and Urban Sanitary Authority have increased the salary of the Surveyor from £100 to £125 per annum.

The Local Government Board have declared the 90th section of the Public Health Act, relating to the making of by-laws as to houses let in lodgings, to be in force within the Local Government District of Pontypriid.

The Honiton Town Council and Urban Sanitary Authority, at a special meeting, Mr. J. C. Macaulay, the Mayor, presiding, unanimously passed the following resolution, upon the motion of Mr. Hellier, seconded by Mr. Wood:—That the Council record their sense of the activity of their late sanitary inspector (Mr. James Summers Plucknett) in endeavouring to stop the spread of small-pox in Honiton, and to express their deep regret that in discharging such duties he should have succumbed to the disease; and that the Mayor be requested to forward, on behalf of the Council, a copy of the resolution to Mrs. Plucknett, and to express fully the deep sympathy of the Council for her in the sudden and sad bereavement.

Mr. Matthew A. Adams, the public analyst for the county of Kent, reported to the Epiphany Court of Quarter Session that 115 samples of food had been received for analysis during the last quarter; of this number 18, or 15.6 per cent., were found to be adulterated.

The Finance and General Purposes Committee of the Justices of Kent, in their report to the Epiphany Court of Quarter Session, stated that with regard to the carrying out of the Food and Drugs Act the total expense amounted to 8s. 1rs. 6d. The fines amounted to 9s. They again felt compelled to appeal to the Court for that assistance and support in carrying out the requirements of an Act of Parliament of the greatest importance, which can only be given by justices at petty sessions systematically inflicting penalties in some measure commensurate to the cases as proved.

At a special meeting of the Chesterfield Rural Sanitary Authority on Thursday, Jan. 29, Mr. F. Barber presiding, it was stated that the term for which Dr. Macintosh was appointed medical officer of health would expire on March 25, and Mr. Croudace moved that he be re-appointed for three years from that date, at his present salary of £400 per annum. This was seconded by Mr. Jackson, J.P. As an amendment, the chairman proposed that he be appointed at a salary of £300 per annum, subject to the sanction of the Local Government Board and the repayment of half the amount by the Treasury, and that, in the event of the Local Government Board refusing their sanction, he be appointed at a salary of £200, with liberty to hold any other public appointments, but not to engage in private practice. The amendment was seconded by Mr. Berry, and on being put to the meeting was carried by seven votes against six.

The Rugeley Local Board and Urban Sanitary Authority, at their last meeting, received and read a letter from the Local Government Board complaining that an Inspector under the Sale of Food and Drugs Act had not been appointed, upon which a member remarked that, as they had done without such an officer for ten years, he thought they might do so a little longer; and the other members concurred, so that the Act of Parliament is there, as in many other places, a dead letter.

The Dorking Local Board and Urban Sanitary Authority have increased the salary of Mr. George S. Mathews, the Surveyor, from £190 to £200 per annum.

The Gainsborough Local Board and Urban Sanitary Authority have increased the salary of Mr. T. M. Cooper, the Collector, from £70 to £90 per annum.

At the Monthly Meeting of the Lincoln Urban Sanitary Authority on Tuesday, the 3rd instant, the following Resolution was, upon the motion of Alderman Maltby, seconded by Mr. Bourne, unanimously passed:—That the Mayor, Aldermen, and citizens of the city of Lincoln, acting in pursuance of the Public Health Act 1875, as and being the Urban Sanitary Authority for the said city, do in the next Session of Parliament promote a Bill to enable the said Mayor, Aldermen, and citizens of the said city of Lincoln, as such Urban Sanitary Authority, to acquire the undertaking of the Lincoln Gas-light and Coke Company, and to extend the gas limits, and for other purposes; and that the costs and expenses incurred, or to be incurred in, or in relation to the applying for, preparing and promoting such Bill, and the passing the same into an Act, shall be charged on the general district rate, if not otherwise provided in the said Bill, in case it becomes an Act.

A meeting of owners and ratepayers of the parish of Llantrisant, Glamorganshire, has been convened by the churchwardens, pursuant to a requisition signed by twenty owners and ratepayers, resident in so much of the parish as is within the Pontypriid rural sanitary district, and will be held on Monday the 16th inst., at the Parish Offices, for the purpose of considering and passing a resolution that it is expedient that so much of the said parish as is not comprised in any urban sanitary district, should be constituted a Local Government district.

The Lancaster Guardians and Rural Sanitary Authority, at last meeting, reconsidered the terms upon which they re-appoint Mr. J. Jowett, inspector of nuisances and surveyor, as at our last, and, after some discussion, passed a resolution, to the old salary of £190; but for one year only, instead of five.

The Huntingdon Town Council and Urban Sanitary Authority have increased the salary of the surveyor from £90 to £100 per annum.

The Farnham Guardians and Rural Sanitary Authority invested with urban powers, rights, &c., under Sect. 26 of the Health Act, so far as it relates to the erection of a bulk sewer, under so much of Sect. 44 as is not already in force, Sects. 157 and 158, within the contributory place of Frimley.

The Medical Officer of Health for the Bristol Urban Sanitary District, in his report to the Authority at the meeting of the 10th inst., recommended that the house-to-house visitation, hitherto to houses occupied by the working classes, should be extended to those of every class throughout the district, and that three Inspectors of Nuisances should be appointed for that purpose; some discussion the recommendations were adopted, and minutes issued which resulted in 107 applications, from a very careful consideration, Messrs. Ainge, Hasell, and I have been appointed. Mr. Ainge has the diploma of the Sanitary Inspector of Great Britain, and a bronze medal for sanitary plumbers &c.; Mr. Hasell is a practical plumber of great experience in sanitary work, and was, up to the time of his appointment, employ of a leading firm at Bristol; and Mr. Rose has been by the London Sanitary Protection Association, and testimonials.

The recommendation of the Health Committee of the Improvement Commissioners and Urban Sanitary Authority, for the appointment of a Medical Officer of Health for the Urban Sanitary Districts, vacant by the death of Dr. Jeffery, should be made jointly; that the salary for the former should be from £90 to £100 per annum; and that the terms and conditions of the Port appointment should be unaltered, came on for consideration on the 9th instant. After some discussion, a resolution negatived the proposed increase of salary for the Urban District was carried by eleven votes against seven, and the remainder of the recommendation was adopted.

NOTES AND QUERIES.

Having for some time back been in the receipt of Queries relating strictly to sanitary work, and which it would be easy to answer without having to refer our correspondent to competent professional advisers, we have opened a column in which to register such Queries. Replies thereto as can fairly be expected from us; and our readers are invited to make such use of this column as may benefit themselves and the community. Both Queries and answers will, however, be subjected, if unnecessarily long, to a strict cut.

143. HOW TO VENTILATE A SCHOOLROOM.

Will you be so good as to let me know in your Notes and Queries what is the best method of ventilating a large schoolroom, the roof, and without any ceiling?

[It is impossible for any person to give a detailed plan for ventilating any room without seeing it, and knowing size, &c. Systems of ventilation should include arrangements for bringing in fresh air, and exhausting the vitiated, but the best application of this must be dependent to some extent on the surrounding building. Consult one of the ventilating engineers adverted to in the SANITARY RECORD.—ED.]

144. DEATHS FROM ZYMOTIC DISEASE.

Could you inform me what was the number of deaths in London during 1883 or 1884 from preventable causes? How many of children under five years of age, and how many adults?

[The number of deaths from the principal zymotic diseases in England and Wales during 1883 was 45,534, of which 35,717 of children under five years of age. The deaths in London during 1884 from the principal zymotic diseases were 13,609, of which 10,542 were of children under five years of age.—ED.]

145. SEWERAGE SYSTEMS.

The board of guardians of a rural union contemplate the division of their parish, and have appointed a committee to visit and report on the best systems of 'precipitation' or of otherwise treating sewage as introduced at different places. They are anxious to obtain the best information they can upon the subject, and have ventured to think that you might assist them a little by advising them where any system has been most successfully carried out, by giving them any general further information upon the subject that you may think desirable.

[You ask a question which would occupy a considerable space in order to formulate a reply. It is quite an engineer's matter, and cannot possibly be gone into in our columns. Before any definite answer could be given many data are required as to population, nature of soil, &c. You might consult Professor Robinson, 7, Minster Chambers, London, S.W., with advantage, or some of the works, which bear upon the subject and go thoroughly into various schemes.—ED.]

ORIGINAL PAPERS.

RIVER POLLUTION.*

By Professor HENRY ROBINSON, C.E.

IN bringing the subject of the pollution of rivers before the Parkes Museum I do not propose to confine my remarks to the sanitary aspect of the case, as I think the purpose we all have in view, namely, the amelioration of the existing intolerable pollution of our streams will be best served by combining all the interests which are favourable to the cause of reform, whether they be piscatorial or commercial, sentimental or material.

Many of my hearers are doubtless aware of the efforts which have been made for years past by zealous reformers to obtain further and better legislation for the protection of our rivers, and I am justified in saying that all who have given serious attention to the subject have arrived at a sufficient agreement on main points to enable further action now to be taken.

One of the most earnest workers in this cause—the late Frank Buckland—gave expression to his views in an address to the Sanitary Institute of Great Britain in 1878, and I would quote his words when speaking of the injury occasioned to fishing interests:—‘If the pollution mentioned in this my address were by law kept out of the rivers within Her Majesty’s realms, I feel sure, and I say it most advisedly, that the fisheries would vastly increase in their salmon-producing powers in a very few years. It is, therefore, most lamentable to think that at the present time, when there are so many mouths to be fed and so many rivers comparatively salmonless, manufactures and mineowners (who form a relatively small portion of Her Majesty’s subjects) should be allowed to inflict, directly and indirectly, such a vast evil on the public in general.’

As far back as 1863 Lord Palmerston’s attention was directed to the serious pollution of the rivers of the country, and since then many efforts at legislation have been made to which it may be interesting to make a brief reference.

1864. ‘The Rivers Pollution (Scotland) Bill, to prevent the discharge of impure water from manufactories in rivers in Scotland.’ This did not pass the Commons.

1865. ‘The River Waters Protection Bill, to amend and better to administer the laws for the protection of waters in rivers and streams in England.’ This did not pass the Commons.

1865. A Royal Commission was issued to inquire into the best means of ‘preventing the pollution of rivers.’

1866. First report of Royal Commissioners (relating to River Thames) was presented.

1867. Another report, relating to Rivers Aire and Calder.

1868. A second Royal Commission issued.

1870. Two reports of the Royal Commissioners were presented, one on the A B C process, and the other relating to the Mersey and Ribble Basins.

1871. A third report was presented, ‘relating to pollution arising from the woollen manufactories and processes connected therewith.’

1872. A fourth report was presented relating to the rivers of Scotland.

1873. A Bill was introduced by the Earl of Shaftesbury. The preamble recited ‘that the pollution of rivers had of late so increased as to become a national evil.’ This passed the Lords, but was withdrawn.

1874. Fifth report, *re* pollution from mining ‘operations and metal manufactories.’

1875. A Bill was introduced in the Lords, ‘for the better prevention of the pollution of rivers,’ and providing for the constitution of a Conservancy Authority. This passed the Lords, but did not proceed beyond the second reading in the Commons.

1876. The Rivers Pollution Prevention Act passed.

1877. The Lords appointed a Select Committee ‘to consider by what means Conservancy Boards could be more conveniently and inexpensively constituted.’ The Committee reported in favour of constituting Conservancy Boards ‘to execute the powers for the prevention of the pollution of rivers conferred on local authorities by the Rivers Pollution Prevention Act.’

1879. The Rivers Conservancy Bill was introduced in the Lords, ‘for the conservancy of rivers and water-courses and the mitigation of floods within their districts.’ This passed the Lords, but was sacrificed in the Commons.

1881. The ‘Rivers Floods Prevention Bill’ was introduced in the Commons, ‘to make provision for the better prevention of floods and for the conservancy of rivers.’ The Lords also had a Bill, namely ‘The Rivers Conservancy and Floods Prevention Bill.’ This soon passed the Lords, and was sent to the Commons, where the Commons’ own Bill had been read a second time. The two Bills were referred to the same Select Committee, which reported in favour of the Lords’ Bill with amendments. Both, however, were lost.

1882. The ‘River Conservancy and Floods Prevention Bill’ was introduced by Mr. Dodson. This was substantially the Bill of the Lords of 1881, with, however, the omission of the important clause empowering the Conservancy Boards to enforce the provisions of the Rivers Pollution Prevention Act of 1876. This was withdrawn.

1883. A similar Bill was introduced, but was dropped.

1884–85. A Bill is now before Parliament for the ‘Prevention of the Pollution of Rivers.’

The risk of seriously interfering with manufacturing interests has often been alleged as a reason for avoiding drastic remedies. This danger has, I believe, been exaggerated, as will be seen by reference to the opinions of those most capable of giving a fair and impartial judgment.

In referring to manufacturing pollution, the Royal Commissioners in one of their reports stated that ‘the remedies for the nuisances which these refuse liquids create have been carefully examined, and after prolonged inquiry and research we have been able to report that in every case efficient remedies exist and are available, so that the present use of rivers and running waters for the purpose of carrying off the sewage of towns and populous places, and the refuse arising from industrial processes and manufactories, can be prevented without risk to the public health or serious injury to such processes or manufactories.’

Sir Lyon Playfair said, in giving evidence before a House of Lords Committee, that ‘if you force us to purify the water which we discharge forced in

* Address delivered at the Parkes Museum of Hygiene, Feb. 26, 1885.

this way, before long we shall find efficient modes of doing it. At the present moment we have not efficient modes of doing it, and yet, as one of the largest polluters of water in the kingdom, from this very thing I advocate that you should make me purify the water before I discharge it.'

The Royal Commissioners recommended the imposition of 'adequate penalties' where 'gross pollution' was continued; also the appointment of officers to whom should 'be committed the duty of detecting and proving offences against the law, and of procuring the conviction of offenders.'

I cannot attempt to quote from the various reports of Royal Commissioners, or from the evidence adduced before them, a tithe of the strong opinion which was put on record against that which still exists in spite of the Act of 1876. Men of the highest eminence and authority, whose views command respect, urged the necessity for remedying these evils years ago. There was no uncertain note sounded in any of the reports. Just let me quote a paragraph from the Fourth Report of the Second Commission, 1872. 'Methods have been described in our reports, involving no excessive expenditure, by which the foulest liquid waste from manufactories can be adequately cleansed. We believe that the adoption of none of them will inflict any injury at all upon manufacturers; indeed, we have every reason to conclude that their adoption will save the manufacturers of this country from inflicting considerable injury upon themselves, whilst, by preserving the whole course of rivers in a comparatively clean and useful condition, they will tend powerfully to the extension of manufactories upon their banks. One of the most crying evils in manufacturing districts is the want of clean water, and therefore every successful effort to make dirty water again usable is a gain to manufacturers.'

It is generally admitted that the Act of 1876 has been practically inoperative, and has failed to accomplish the objects for which it was passed. To show that this is the case, I will mention that in 1883 the Duke of Northumberland moved for a return of 'all proceedings instituted in the county courts in England and Wales for the prevention of the pollution of rivers under the Rivers Pollution Prevention Act, 1876.'

There appear from this return to have been only fifty-three cases. Of these only twenty-seven resulted in Orders being obtained to desist from pollution, and some (I believe the majority) of these Orders have never been acted upon at all.

Although the Rivers Pollution Prevention Act of 1876 has not accomplished as much as was anticipated, it is necessary, in justice to those who framed it, to remember that the general assumption on which it was based was that the local authorities were, under the local-government system, the right and sole machinery to put the Act into operation. They, however, have not done so; and the power which was vested in them has not been exercised, so that it may be confidently asserted that local self-government, as exhibited in relation to the enforcement of the provisions of this Act, has proved a failure.

Under the Act an aggrieved person failing to put in motion the sanitary authority to abate an evil can, under Section 6, appeal to the Local Government Board, and that Board, if on inquiry it is satisfied that the sanitary authority should take proceedings, can direct it to do so. Those experienced in the

ways of local boards will appreciate the zeal and energy with which proceedings commenced by them under these circumstances will be followed up, and the remote prospect the aggrieved person has of getting redress for his wrongs.

Before the passing of this Act it was an offence at common law to pollute a river with refuse. The Act has not improved matters, as ambiguity of language and subtle distinctions have been imported into it which ought to have been avoided. In Sections 2, 3, and 4 the words 'knowingly,' 'solid,' and 'liquid' afford a wide opening for contention, which would not be the case if the first word 'knowingly' were omitted, and the latter words 'solids and liquids' were changed for the word 'matter,' so that it would be clearly understood that any polluting matter whatever discharging into a stream constituted an offence under the Act.

The words 'poisonous,' 'noxious,' or 'polluting' solid or liquid matter fail to define that which causes injury to fish. The late Frank Buckland objected to these words in considering the way that polluting matter affected fish, and he pointed out that a fish is influenced by pollution more through the medium of the gills than through the stomach. An animal destroyed by prussic acid may be said to be poisoned, but fish are destroyed more by suffocation, the gills being always found to be the structure most affected. He noticed that a fish poisoned by pollution, generally speaking, died with the gills and mouth widely extended, as if it was gasping for breath, the gills being the mechanism by which oxygen is absorbed from the water.

It is well known that some fish feed upon part of the suspended matter in sewage, and that a form of plant-life is developed by it which serves as food for fish or for organisms which fish assimilate. These organisms and plants may be regarded as serving to remove the normal pollution to which any river may be subjected, and ought not to be claimed as factors in removing the abnormal pollution to which our rivers are exposed. I think there is a danger that the knowledge which has of late years been acquired with reference to the chemical and biological changes which go on in a river will be used to justify, or at all events to minimise, the mischief arising from sewage pollution. In several great pollution cases which have been tried great pains have been taken to prove that pollution is inappreciable at a certain distance from its origin.

I may instance as confirmatory of this the well-known cases of the pollution of the Rivers Thames, Lea, Wey, and other rivers. In the former case, the Metropolitan Board of Works (the authority) has for years defied public opinion, and refused to recognise the pollution of the Thames at the Barking and Crossness Outfalls. It has required two prolonged inquiries and reports of Royal Commissioners to convince this authority of the existence of the evil. In the other instances several cases have been the subject of litigation, but in all of them it has been the same story—namely, the local authority resisting the allegation that the pollution existed. The reluctance of some boards to act is largely due to the presence of a group of economic members, who consider it to be their duty to the ratepayers to oppose everything which involves an expenditure out of the rates. It is right to record, as my experience of local boards, that a very different class of men to those who are chiefly responsible for the policy of

inaction are found upon most boards, but they too often are in a minority.

As regards sewage pollution, no difficulty can be reasonably alleged now about the process or method which should be adopted with reference to any particular place. Data are now available to guide all who are capable of being influenced by facts; and if those who have to exercise judicial functions in dealing with questions of sewage disposal will disregard prejudice, and decide on the evidence of facts as distinguished from crotchety opinions, not a fractional part of the trouble and expense would arise out of sewage inquiries. At all events, I am sure that no justification exists now for strife and contention about this source of pollution compared to that which was fairly permissible ten years or so ago.

Much of the difficulty which attends the prevention of sewage pollution to a river arises from the outfall sewer being made use of to convey also the whole of the rainfall from the populated area draining into the sewerage system. This ought not to be the case, as the separation of the rainfall, or, at all events, of a considerable part of it, enables the sewers to be more efficient and self-cleansing, and causes the sewage which is removed by them to be brought to the point of discharge in a fresher state than is possible where the sewers are calculated to convey the larger volume. They then inevitably become sewers of deposit in dry weather, and give off dangerous gases. In wet weather the decomposing sewage is flushed away to the outfall in a state which is unsuitable for utilisation on land and is destructive to fish, by exhausting the oxygen from the river.

The law should be precise that no polluting matter whatever should be passed into a river. If a small amount does no harm, or even admit that it does good, to fishes, it is better to prevent them altogether from having this alternative diet than to run the risk of their having far too much, with the certainty of nuisance and of interference with the enjoyment of the river. The following letter, which appeared in the *Times* last autumn, is interesting, and serves to show the danger of leaving in doubt the permissibility of discharging sewage into a river:

'Sir,—It is a remarkable fact that at the meeting of the Severn conservators recently at Worcester the report stated that the salmon disease had entirely disappeared during the late summer. The past season has been the longest, warmest, and driest known in this country for many years, and as the Severn was correspondingly low, and therefore must have been more than usually polluted (in proportion to the small quantity of water), yet the fish disease disappeared! I am also informed by fishermen that some sorts of fish are so well known to congregate near the mouths of sewers that anglers and others make it a rule to seek and find them there. This seems to imply that diluted sewage is attractive to these fish, either as an alternative in their diet or medicinally, and otherwise grateful to the piscine stomach. These facts no doubt confuse, if they do not reverse, our ideas as to the destruction of fish by the pollution of rivers. Where chemicals or other pungent refuse from manufactories are introduced into our streams there can be no question as to their baneful effects on fish-life, but that the sewage of towns is not objectionable to these creatures is a fact which ought to be taken into account in any future Pollution of Rivers Act.

The argument hitherto urged, and unanimously accepted, that the discharging of sewage into our streams tended to the destruction of the fisheries would seem to be no longer tenable.

'Yours, &c.

'J. NOAKE,
'Severn Conservator.'

'Worcester.'

Although I hold that ultimately no pollution of a river should be allowed, yet where a stream has been employed to carry off polluting matter from manufactories, the remedy that has to be provided requires to be enforced carefully and, perhaps, slowly at first, with a view to prevent sudden injury to trading interests which might lead to a discontinuance of the trade, and a consequent loss both to the manufacturer and to the poorer classes in the district. A considerable part of the polluting matter now passing into streams is capable of being removed by subsidence or mechanical straining without chemicals. As tanks are required in any system of sewage treatment, they could be made a *sine quâ non* even at the outset, and their provision could be made absolutely compulsory under the Act to commence with. The size of the tanks was considered by the Rivers Pollution Prevention Commissioners, and they proposed that the flow for six hours should be impounded. This, however, admits of variation by constructing the tank in duplicate with an upward straining-frame, by which the suspended matter would be arrested and flushed or pumped out at intervals, the fluid passing continuously.

The distinction that is made between a channel constructed before the passing of the Act of 1876 and one made since seems undesirable. If discretionary power is vested in those who have to enforce the Act, I think this distinction could be safely done away with.

The Rivers Pollution Commissioners in their fifth Report recommend the condemnation of liquids which did not comply with the following standards:—

(a) Any liquid which has not been subjected to perfect rest in subsidence ponds of sufficient size for a period of at least six hours, or which, having been so subjected to subsidence, contains in suspension more than one part by weight of dry organic matter in 100,000 parts by weight of the liquid, or which, not having been so subjected to subsidence, contains in suspension more than three parts by weight of dry mineral matter, or one part by weight of dry organic matter in 100,000 parts by weight of the liquid.

(b) Any liquid containing, in solution, more than two parts by weight of organic carbon, or .3 part by weight of organic nitrogen in 100,000 parts by weight.

(c) Any liquid which shall exhibit by daylight a distinct colour when a stratum of it, one inch deep, is placed in a white porcelain or earthenware vessel.

(d) Any liquid which contains, in solution, in 100,000 parts by weight, more than two parts by weight of any metal except calcium, magnesium, potassium, and sodium.

(e) Any liquid which, in 100,000 parts by weight, contains, whether in solution or suspension, in chemical combination or otherwise, more than .05 part by weight of metallic arsenic.

(f) Any liquid which, after acidification with sulphuric acid, contains, in 100,000 parts by weight, more than one part by weight of free chlorine.

(g) Any liquid which contains, in 100,000 parts by weight, more than one part by weight of sulphur.

in the condition either of sulphuretted hydrogen or of a soluble sulphuret.

(b) Any liquid possessing an acidity greater than that which is produced by adding two parts by weight of real muriatic acid to 1,000 parts by weight of distilled water.

(c) Any liquid possessing an alkalinity greater than that produced by adding one part by weight of dry caustic soda to 1,000 parts by weight of distilled water.

(d) Any liquid exhibiting a film of petroleum or hydrocarbon oil upon its surface, or containing, in suspension, in 100,000 parts, more than '05 part of such oil.

It is a question whether these standards should be incorporated in any Act, as it is most important that it should be free from the risk of having standards inelastic or of an arbitrary character without reference to the varying conditions of the cases to be dealt with.

I brought the question of River Pollution before the Congress of the Sanitary Institute of Great Britain at Glasgow in the year 1883 (*see* SANITARY RECORD, vol. xv., page 166), the late Dr. Angus Smith presiding over the section in which my paper was read. I expressed the opinion that the Rivers Pollution Prevention Act was practically a dead letter, but Dr. Angus Smith (who was one of the Inspectors under the Act) thought it had not been inoperative, although he had uniformly refused to give a certificate under section 12 of the Act, owing to the wording of it, which is as follows:—'That the means used for rendering harmless any sewage matter or poisonous, noxious, or polluting solid or liquid matter, falling or flowing or carried into any stream, are the best or only practical and available means under the circumstances of the particular case.' Dr. Angus Smith said that he felt justified in refusing his certificate unless the best means were used, and he expressed an opinion that these words were too stringent.

In lieu of standards of purity being inserted in a modified Act, some have suggested that the coefficient of purity required should rise or fall with the state of purity of the river at the point of discharge. This, I think, is an undesirable system to adopt. It is well known that the mischievous effects produced by foul organic matter passing into a stream will continue to operate in a short or long distance, according to whether the stream has or has not the oxygenating power to cleanse itself of these impurities. A river in a foul state has its recuperative powers severely taxed, and is less able to deal with pollution than if it is in a clean state. The pollution added to a foul stream will remain pollution for a long distance, whereas, if it were added to a stream having power to oxygenate it, the injurious effects would be felt for only a short distance. The purifying capacity of a river can be ascertained by the use of Schutzenberger's apparatus for the determination of the dissolved oxygen in water, the basis upon which the system is founded being the great affinity of hyposulphite of soda for oxygen. By ascertaining the amount of free oxygen that a known volume of water yields to a known volume of hyposulphite of soda, the power of the stream to oxidise impurities can be defined.

It will have been noticed that the recent efforts to legislate on the question of rivers have been more in the direction of dealing with the matter on a wide basis, and not confining it to pollution. This has

been due to the necessity having been recognised for taking measures to extend the scope of local administration by the creation of Conservancy or County Boards, having jurisdiction over large areas, and being charged with all duties of local government intermediate between the existing authorities and the Local Government Board. The extent of the powers vested in such Boards, and the way in which those powers are to be enforced, still require much consideration. There is no doubt that the recommendation of the Select Committee of the Lords in 1877 will be adopted, by which Conservancy or County Boards would put into operation the powers of the Act of 1876, and would be responsible for the purity of the rivers.

If such a new authority were constituted, it would be a step in the direction of local government or home rule, which would relieve the central department and enable much-needed sanitary work to be accomplished which is now untouched. In creating such an authority, so far as dealing with rivers is concerned, it is a question whether the physical features or watershed of a district should constitute the proper boundary, or whether the populations and towns on or near to it should be included, so that the Board would be formed with reference to the drainage area, at the same time without undue interference (for statistical purposes) with the sanitary and registration districts. In dealing with a river, two or more neighbouring Boards would have, in some cases, to form a joint committee, as the river basin would be in more than one area.

A Bill is now before Parliament for the amendment of the Rivers Pollution Prevention Act of 1876. It has been drafted by Mr. Willis-Bund, Chairman of the Severn Fishery Board, aided by Mr. William Burchell, and has been brought in by Mr. Hastings, Earl Percy, and Colonel Walrond, all of whom have taken a deep interest in this subject. The Bill removes many of the defects of the existing Act, and even if it is not perfect, it is capable of being amended. The standards of purity recommended by the Commissioners have been adopted in this Bill, and it is on this point that I think the most difference of opinion exists. I have already said that I think great elasticity should be given in respect of standards.

One good feature about this Bill is that it improves the machinery for enforcing its provisions, as any injured person can go to the nearest court, and this tribunal has the power vested in it to order a scientific inquiry, and to decide what shall be done if it finds that the complaint is well founded.

Under this Bill there would doubtless always be the possibility of an aggrieved person being actuated by vindictive or foolish motives, and some have regarded this as a reason for complicating the machinery which had to be put in motion. I do not agree with this, as I would prefer to see a frivolous and senseless person occasionally giving trouble without sufficient reason, and with little expense to himself, if sensible persons were able to carry their point quickly and cheaply when they took action.

'The National Society to secure effective legislation against River Pollution,' is now urging that this Bill should receive the support necessary to enable an Act to be obtained this Session. The 'National Association for the Promotion of Social Science' has invited the co-operation of the various sanitary societies to wait upon the President of the Local Government Board, with a view of securing legisla-

Session. The 'Sanitary Institute of Great Britain' has appointed a committee to consider this. The council of the 'Parkes' Museum' are very alive to the need of action, hence my writing you to-day.

The amendment of the Act of 1876 is taken *per se* independently of the other matters affecting the Government, I think that modifications can be made with difficulty by which the optional character of the Act will be changed, and its enactment made obligatory upon the local authorities. The other necessary amendments which are indicated in the foregoing remarks can, in my opinion, be easily drafted, and in terms which admit of no doubt. If the prospect of carrying out a measure of local government is remote, I am of the opinion that an effort should be made to pass the Bill which is now before Parliament so that it might pass this session, and so accomplish a great and increasing evil, upon which my opinion has been unmistakably expressed. It is by asking the co-operation of all in the country which is now being made to prevent a continuation of the present pollution of the rivers of which has been truly characterised by Lord Salisbury as a 'national evil.' Their restoration to original purity will, I trust, be the result of sustained efforts on the part of those who are interested earnestly in this cause.

LEWIS THOMAS, B.A., of Sidney Sussex College, Cambridge, and Lincoln's Inn, has been appointed an officer of the Mansion House Council on the part of the People.

HEALTH RESORT.—The parish of Presteign, in Herefordshire, and Radnor, is very remarkable for the health of its inhabitants. By the last census it contained 2,214 of these twelve now are in their seventieth year, seventy-first, three in seventy-second, two in seventy-third, one in seventy-fourth, six in seventy-fifth, twenty-sixth, eight in seventy-seventh, two in seventy-eighth, one in seventy-ninth, seven in eightieth, thirty-first, seven in eighty-second, four in eighty-third, five in eighty-fourth, one in eighty-fifth, one in eighty-sixth, one in eighty-seventh, and one in ninety-eighth year. This last year the people gathered potatoes in their garden. One couple married fifty years, another fifty-three, another fifty-five. An aged person in indifferent health fifty years ago to the parish, and never since day's illness.

IMPROVEMENT IN NAAS.—We learn from the *Irish Times* on the recommendation of Dr. Smyth, medical officer of health for Naas, the guardians of the Union have adopted the 'pail' system as the most effectual for the present defective sanitary condition of the town. The medical officer stated that out of 500 houses there to be in Naas, 400 were without sanitary arrangements of any kind, and that their owners would not adopt the 'pail' system, for the sake of economy. The proposed scheme would, in the opinion of Dr. Smyth, improve sanitary administration, and, in proportion to its efficiency, would, in a general way, raise the standard of health, and in a special way increase the resistance to contagion. It would, silently and surely, teach the people the lesson of cleanliness in their dwellings and their persons, and in their habits. It would bring the minds of many owners, probably for the first time, to the necessity as well as the advisability of improving their houses. Out and within, many of the present wretched dwellings of the poor. It would also justify many an owner in his authority to enforce cleanliness, for an unclean tenant is a nuisance and a danger to the health of the neighbourhood.

THE DOGMATISM OF SANITARY REFORMERS.

By D. J. EBBETTS.

IT seems to be the fate of all young sciences, in their earlier stages, to afford free scope to the dogmatism of their less cautious expounders.

The professor of a new science must possess considerable self-control and some modesty, if he does not fall a ready victim to the Nemesis of dogmatism in face of the occasional insecurity of his position. Otherwise the more insecure his position the more easily his fall.

We can easily see that the imperious utterances of an incautious exponent will prove their own Nemesis; for I suppose most of us are agreed that the only way to induce people to take an interest in sanitary science is by pointing out its momentous importance to all in simple language; and by persuading them that all we recommend is necessary to attain the desired end. Now there may be a few weak people here and there who will be content to accept a dictatorial assertion that such and such a thing is absolutely necessary, without further inquiry, but such persons are but poor supporters of any cause, for the first breath of adverse criticism will draw them away as readily as they were originally beguiled. On the other hand most people, I hope and believe, will require to be shown why such things are so necessary, and if their inquiries are only met by general assertions, will pay but little heed to their *quasi* instructors.

To render myself clear I will take a case in point, though in doing so I may probably shock a great many people.

You will find it often asserted in the most positive manner that a water-closet must *not* be supplied from the same cistern as the drinking water. Now if you look to see why this prohibition is imposed upon us you will find only a general statement that pollution of the drinking water is sure to follow upon such an arrangement. And anyone interested in the subject will remark that the exception is not taken to any particular arrangement of water supply, such, for instance, as a spindle valve with air-pipe in the cistern itself, but applies with charming impartiality to all arrangements alike.

In the annotated edition of the Model By-Laws, p. 105, after insisting upon the necessity of forbidding water-closets to be supplied direct from a rising water main—a necessity which for several reasons it is easy to admit—and after insisting on the closets being supplied from a cistern, the text continues, 'but even when such a cistern is provided, there still remains a tendency for the escape of foul air from the basin of the closet up the service pipe and through the body of water in the cistern itself, thus leading to contamination of the water.'

I suppose this authoritative statement ought to be sufficient for most men, but it will be noticed that it is not attempted to be shown how the foul gases could pass up into the cistern—it is simply stated that a tendency of that kind remains.

Now, leaving this subject for a moment, I suppose my experience has only been that of many others when I say that I have found great difficulty in persuading people in the occupation of old houses in towns, replete with every ingenious appliance for the conveyance of sewer-gas to the interior of their dwellings, to have even the most glaring and mis-

chievous errors in house drainage and plumbing rectified. The great cost of such work, when properly done, in proportion to the value of the house, in addition to the inconvenience necessarily incident to the presence of workmen in the building, prevents so many from undertaking work of this kind. Anything which tends, therefore, to increase unnecessarily the cost and disturbance of such work, serves materially towards preventing the necessary and pressing sanitary wants from being attended to.

The provision of an additional cistern and supply-pipes for closets only, in an existing building, is often a serious item. Very often it is difficult to find a suitable place for the cistern; it generally involves considerable disturbance of existing work of different kinds, and always results in a serious additional outlay. The small supply cistern fixed in the w.c. itself, so often used in connection with wash-out closets, is not free from these objections, and is subject to another which it is not necessary for me to enter into at present.

Feeling convinced, then, of the undesirability of insisting upon more disturbance of existing plumbers' work than was really imperative, I had the temerity some three or four years ago to ask a sanitary engineer whether it were not permissible to connect a valve w.c. direct from a drinking-water cistern.

Never shall I forget the look of professional pity with which he informed me that no one who had any knowledge of sanitary engineering would think for a moment of doing so, that it would result in tainting the water, typhoid fever, &c. Recovering what courage I could, I pressed him to tell me in what way the water would become tainted, but I could only extract the usual general statements that the pipe might be emptied, and so the water in the cistern would be in open connection with the closet.

I have, in fact, been unable to extract from any authority a clear statement of the manner in which the danger accrues.

Now, if we look into this question for ourselves, we shall find it not quite such a simple one as many would have us suppose. How can the water in the cistern be tainted? Let us assume that we have a good valve water-closet apparatus, with a $1\frac{1}{2}$ inch water-valve connected with the cistern. We will suppose that the closet has a P trap, with outgoing into a closed soil-pipe connected directly with a foul old drain. I am assuming this for the sake of argument, for of course no one with any knowledge of the subject would allow the soil-pipe or drain to remain in this state, whatever he proposed to do to the closet.

We will assume that the house has remained empty for some time, and the handle of the closet, by some curious coincidence, has been fixed up. As a consequence, the water from the cistern will soon empty itself down the soil-pipe; for we may as well assume, to complete our pleasant picture, that the water has been cut off at the rising main by an over-bearing or long-suffering water company. The foul gas, we must admit, will pour up freely from the soil-pipe, and, it is assumed, will find its way up the supply-pipe to the cistern. But why? What is to produce a strong draught up this $1\frac{1}{2}$ -inch pipe to suck in the foul air at one end through the narrow flushing rim and emit it at the other end into the cistern?

But supposing we admit—and, having admitted so much, we had better hesitate no longer—that the

pipe once empty, the foul gas would soon ascend it. Why, then, I would point out that the pipe is not empty yet. Anyone who looks at an apparatus with the usual water-valve will see that the centre of the water-valve is some nine inches below the centre of the inlet to the basin, so that the supply-pipe descends to the valve and ascends to the basin. It follows, therefore, that after emptying the cistern there still remains two or three feet of the $1\frac{1}{2}$ -inch pipe filled with water. This water will evaporate in time, no doubt; but how long do you think it will take to evaporate? There are only two small surfaces of water, neither of them exposed to draught or rapid movement of the air. I believe I am within the mark in saying that this water would not evaporate in our climate under six months.

A pertinacious opponent may contend that after the lapse of this time gas would ascend the pipe to the cistern, and, water being admitted to it by the relenting company upon the opportune arrival of a new tenant, the contents would be dangerously contaminated.

But bear in mind that the dreaded sewer-air has for six months or more been admitted in volume into the house night and day, it has filled every nook and corner of that ill-fated and far from desirable residence, and wherever the tank may be located sewer-gas has found its way to it from the house long before it has been able to reach it by the pipe, so that, had there been a separate cistern for household purposes, it would have been treated as badly as the other one.

Seriously, if a tenant were to take a house in such an unsavoury condition he would be forced to have it first of all thoroughly disinfected, and certainly would be obliged to have all the cisterns emptied and cleansed, so I fail to see what he would gain by a separate cistern.

In arranging a new house I should prefer as a matter of sentiment to supply even a proper valve w.c. from a separate cistern; but in old houses, where it is desirable not to increase the expense of sanitary work more than is absolutely necessary, I should not in my present state of ignorance think of doing so, and I venture to think that I have shown that it cannot be really necessary to do so.

There are several other dogmatic laws generally accredited to sanitary engineers that might be controverted with some success, but for the present I hope that I have justified my warning to all to be chary of encouraging dogmatism in this as well as in all other scientific work.

MESSRS. BANNER BROS., 11 Billiter Square, E.C., have been commissioned to entirely overhaul the sanitary arrangements of Herbert House, Belgravia, the town residence of Lady Herbert of Lea, and substitute the 'Banner system' throughout. The work is being carried out under the able superintendence of Mr. E. A. Hubert, Messrs. Banner's engineer. We learn also that Banner's fixed ventilators are being used on the new portable hospitals that are being sent out to the Soudan.

SANITARY inspectors are decidedly becoming awakes to the responsibilities of their calling. We note with pleasure and approbation that Mr. Joseph Lindley, Assistant Sanitary Inspector in the Sanitary Department, Leeds Corporation, has gained in the Science Examinations, held in Leeds in May last, certificates for Advanced Hygienic Elementary Animal Physiology and Advanced Building Construction. The practical advantage of an intelligent knowledge of the first and last of these subjects for a sanitary inspector, is incontestable.

DAMP WALLS IN DWELLINGS.

By G. H. BLAGROVE, A.R.I.B.A.

the many fruitful sources of ill health con- upon defective modes of building, damp certainly not the least formidable or most medied. Unlike the offensive smells arising perfect drainage, damp in walls does not self immediately evident to the senses, and is disregarded, while its baneful effects are in part to other causes. The difficulty and of remedying such an evil are sometimes able, and recourse is too often had to tem- expedients. Thus, when a room has been ed for some time, and the presence of damp t in its walls, it is thought sufficient to light by this means the signs of damp may be disappear from the walls, while it is still in the atmosphere, although in a rarefied during the cold hours of the night, however, ous that condensation must ensue, and it is that the walls, having once been damp, become so. More moisture will be ab- rom the external atmosphere, to be again and rarefied by heat, and again allowed to itself upon the objects in the room or the of its occupants. Such is the process that e place in moist situations, in a greater or ee, according as the walls of a dwelling are less pervious to damp.

are a variety of ways in which a wall may impregnated with moisture, and it is im- hat these should be thoroughly understood edies are sought for or applied. Internal y absorb moisture from the ground beneath. liable to take place in proportion to the the foundations, by which the tendency of ure to force its way upward is accelerated rease in the weight which presses upon it ve. Having once made its way into a wall, rises, partly by evaporation aided by capil- iction, and the wall becomes permanently An external wall may become damp from this ly, or from the far more serious one of being ct with the earth. It is quite clear that, the nature of the soil, the pressure of its ht must cause a large amount of moisture laterally, except in very dry weather, and h moisture is readily transmitted through nary thickness of walling, and must be a lly recurring source of danger to health. No oining such a wall should be permitted to or human habitation.

ernal wall may become damp through the driving rains, or from mere contact with a nosphere. The effects are similar to those l in a wall exposed to contact with the cept that they are less strongly marked. ess of moisture aided by wind force natur- es place most frequently upon those sides ilding which face in southerly directions. icide such local accidents as the bursting of er pipes, or the leaking or overflowing of tters, there is only one other cause of per- dampness in walls to be noticed, and this is ward soakage of water from the top of a from an off-set. In old walls, where the cement has suffered partial disintegration, a modicum of rainfall is absorbed by the k or masonry, and, by gradually percolating

through the open joints, is transmitted from brick to brick, or from stone to stone, until the walls become damp, sometimes to the depth of the entire upper storey of a house. At off-sets, or where stone cills or balconies are built into a wall, there is always a danger that repeated falls of rain upon the upper surfaces of such projecting parts may drive a certain amount of water through the joints of the walling, from whence it will soak downwards, and sometimes upwards as well.

In adopting remedies against damp walls, pre-vention is better than cure. The customary pre- cautions followed in all sound building work are, of course, well known to architects and contractors, but the general public ought to be informed of their relative value and importance. To prevent moisture from soaking up into a wall from the ground below, it is usual to build in a damp-proof course through- out the entire thickness of every wall. This damp- proof course is a layer of some impervious material, and must be placed in the wall above the highest level of the earth with which it is in contact, and below any wall-plates or other timbers connected with the construction of the floor. A double course of slates set and bedded in cement, the upper course breaking joint with the lower, has often been used as a damp-proof course. It is economical, but as the slates are liable to fracture from any settlement in a building, it is not to be recommended. A single course of glazed pottery slabs is often used, the joints between the slabs being left empty, to prevent the damp from rising through them. This, though it forms an effectual damp-proof course, destroys the bond of the wall, and is therefore objectionable upon structural grounds. Sheet lead is efficacious, but will be found too expensive for general use. In some parts of the country, thin slabs of impervious stone have been used with satisfactory results, and there is no doubt that a double course of plain tiles in cement will answer well, and be less liable to fracture than slates. Various kinds of asphalte are manufactured for this purpose, and a thick layer of this material will form an effectual barrier to damp, and will not be subject to injury through settlements. Cases have been known when asphalte damp-proof courses have been eaten away by rats, and where such vermin exist it is therefore inadvisable to employ it.

When damp rises in a wall which has been built without a damp-proof course, the proper remedy consists in underpinning it, and inserting one. This involves considerable expense, but all other ex- pedients are inferior to it. If the wall be only slightly damp, the room adjoining it may be kept tolerably dry by rendering the wall with Portland cement, or better still, with glazed tiles set in cement; but if there be much moisture present, it will be liable to evaporate under the floor, when the latter is boarded, and so to impregnate the atmosphere of the room.

To separate the underground portion of an external wall from contact with the earth, it is usual to build a dry area around it, extending to a depth below the damp-proof course, and being about 12 inches wide at that part. Sometimes the outer wall of the area is made of a sufficient thickness, and built at a sufficient slope, to act as an inde- pendent retaining wall against the earth, in which case the area is open at the top, and admits of a free circulation of air. The top of the outer wall should be above the level of the surrounding earth, to prevent any surface water from flowing into the

area, which must of course be drained with pipes properly trapped into the house drains. Sometimes the area wall is built parallel to the main wall, thus forming a portion of hollow walling, and the top of the cavity is covered with a stone slab. In this case means ought to be provided for connecting the cavity with the external air without admitting the rain. This may be done by carrying the double walling to a sufficient height to admit of the insertion of ventilation gratings above the ground, or by small tubes carried up inside the main wall, turned out, and bent down. The double walling should be bonded together, either with galvanised iron cramps, kinked so as to prevent moisture from travelling along them, or with special bond bricks contrived with drip channels underneath them for the same object. As a substitute for a dry area, a basement wall is sometimes rendered with Portland cement upon that part of its surface against which the earth rests. The cement rendering ought to be carried down to a level below the damp-proof course, to exclude damp effectually, and even then it is always open to the objection that the cement may crack and peel off, and that its condition cannot be observed without excavating large quantities of earth. A coating of asphalt is to be preferred, and this may be built into the walling as a damp-proof course, and carried up in one piece against the outside. The latter expedient is, perhaps, most to be recommended in dealing with an old wall that has been built without a dry area, and where it is necessary to spare expense as much as possible.

Hollow walls built in the manner described afford great protection against the ingress of moisture from the atmosphere. The thinner portion of the hollow wall should be built upon the outside, in order that the greater thickness may remain dry, and the cavity should always be ventilated and drained. When damp is found to penetrate through a solid wall, and considerations of economy preclude the building of an extra casing, so as to form a hollow wall, some kind of external covering may be adopted as a cheap substitute. A rendering of Portland cement, further protected by painting, will effectually exclude rain or mist. Hanging tiles or slates will also answer the purpose. They must be fixed with copper or galvanised iron nails, which are not liable to become brittle from corrosion. When moisture is found to soak in at the upper surfaces of stone cills or balconies, small aprons of lead should be pinned into the joints immediately above, and allowed to stand out a short space from the wall. A cement weathering may answer the purpose, but is less likely to be of lasting efficacy. Offsets should have weathered and throated stone strings or copings above them, or be weathered in cement. A double course of plain tiles in cement is sometimes used in such situations, but it does not effectually prevent moisture from soaking into the wall above, unless it is laid at a slope, in which case it is probably as good an expedient as any that can be devised. The best way to prevent the downward soakage into a wall from the top is to form the roof with overhanging eaves, having a cast-iron gutter affixed to a fascia board at the feet of the rafters. Such a method of finishing a roof is often adopted, especially in suburban dwellings, but there are practical objections to be urged against it, the principal one being that it allows of no access to the gutter, except by means of a ladder from outside, and it is customary to build parapet walls to fronts and backs of

most London houses. The top of a parapet wall, being much exposed to the action of the weather, should be protected by a weathered and throated coping of stone or terra-cotta. The objection to the ordinary brick coping is, that it has no throating or drip-channel under its projecting edges to prevent water from soaking into the joints below. The same is true of the common tile creasing, which is really nothing more than a damp-proof course, and affords insufficient protection in exposed situations.

We have endeavoured to point out the principal causes of dampness in walls, and the most efficacious means of preventing the evil. The would-be tenant of any house should satisfy himself, before becoming party to an agreement, that those precautions against damp which we have indicated as essential, have been complied with in the construction of his new dwelling. The existence of damp-proof courses is matter for conjecture only, but the signs of damp in basement-walls can generally be detected. Sometimes, if not evident at first sight, they will show themselves after a fire has been lighted. It is well to be on guard against devices for concealing signs of damp, such as fixing match-board against a wall, or planting battens upon it to receive the lathing and plastering. Such expedients only suffice to save appearances, while the radical evil continues to be a source of discomfort and a menace to health.

MR. TORRENS'S Waterworks Clauses Act Amendment Bill has been blocked by Mr. Warton and Mr. Alder-Douglas, and Mr. Coope intends to move that it be referred to a hybrid committee.

MR. F. H. TULLOCH, A.M.I.C.E., was appointed on the 16th ult. by the King's Norton Rural Sanitary Authority, as consulting engineer, to make an examination of their sewers and to advise the Board what steps should be taken to ensure more efficient ventilation.

MANY disastrous explosions of gas have lately been reported as resulting from searching for leaks in pipes with open lamps. We learn from *Invention* that these sad accidents are avoided in Paris by the use of an electric lamp, supplied by an accumulator, the use of such a light being enforced by the authorities.

THE Blackburn and East Lancashire Infirmary governors, at their recent annual meeting, took occasion to congratulate themselves on the completion of the new wing to the building, and on the satisfactory way in which this work, and the sanitary re-arrangements of the building generally had been accomplished under the superintendence of the architect, Mr. A. W. R. Simpson.

DR. DAVIES, from the Local Government Board, has visited Dartmouth to make inquiries as to the arrangements which have been made in the event of an outbreak of cholera or other infectious disease. Accompanied by the Mayor and several members of the Council, Dr. Davies proceeded to the proposed sites for the hospital, and was made aware of the difficulty that has been experienced by the local authority in finding a suitable site for the purpose. Dr. Davies suggested, as probably the best way to get out of the difficulty, that there should be provided a postern, with a hut on the deck, somewhat similar to a floating hospital of that kind upon the River Tyne.

COVENTRY SEWAGE.—The Town Council of Coventry have decided to considerably enlarge the sewage works of their city to meet increase in population, and have instructed Mr. Melliss, C.E., to carry out the work. The sewage of Coventry has been for the last ten years dealt with by a combined system of chemical precipitation with filtration through land, and the operations have given general satisfaction.

CALENDAR

March 16th to March 22nd

16	Monday	Building Exhibition, Agricultural Hall, opens.
17	Tuesday	Institution of Civil Engineers Ordinary Meeting, 8 p.m.
18	Wednesday	Society of Arts Ordinary Meeting, 8 p.m.
19	Thursday	Harveian Society Ordinary Meeting, 8.30 p.m.
20	Friday	Society of Medical Officers of Health Ordinary Meeting.
21	Saturday	National Vaccine Establishment commenced, 1809.
22	Sunday	Fifth Sunday in Lent.

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BANNER'S CAST-IRON AIR-TIGHT MANHOLE COVERS have been applied at the Great Northern Hotel, King's Cross; Brighton College; the Duke of Bedford's Residence, Woburn Park; the Marquis of Headford's Irish Seats; Finsbury Barracks; and at many other important places.

BANNER BROTHERS & CO., 11 Billiter Square, London, E.C.



SECTION OF COVER SHOWING JOINT

SILVER MEDAL, HEALTH EXHIBITION.

SILVER MEDAL, CRYSTAL PALACE.

RUSTLESS IRON.

THE BOWER-BARFF RUSTLESS IRON COMPANY, LIMITED.

Furnaces now in constant operation in London. Iron for Treatment to be consigned to the Company,

SKIN MARKET PLACE, BANKSIDE, S.E.

Rain Water Builders', and Sanitary Castings Bower-Barffed supplied from London Stock. For Prices and all details apply to the Company,

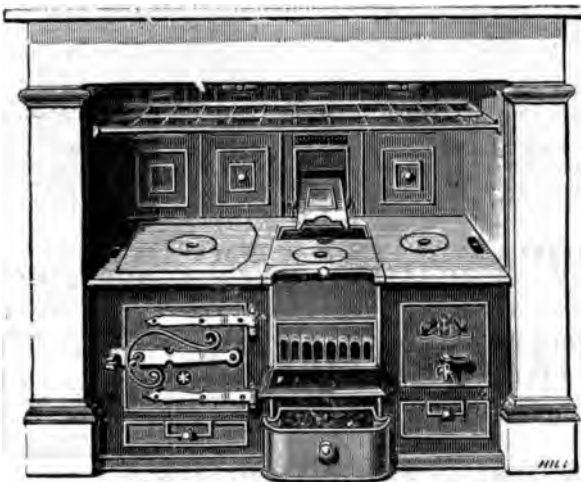
23 QUEEN VICTORIA STREET, E.C.

CALENDAR

March 23rd to March 31st

23	Monday	Medical Society Ordinary Meeting, 8.30 p.m.
24	Tuesday	National Health Society Ordinary Meeting, 4 p.m.
25	Wednesday	Society of Arts Ordinary Meeting.
26	Thursday	Duke of Cambridge born, 1819.
27	Friday	Clinical Society Ordinary Meeting, 8.30 p.m.
28	Saturday	Building Exhibition, Agricultural Hall, closes.
29	Sunday	Palm Sunday.
30	Monday	Medical Society Ordinary Meeting, 8.30 p.m.
31	Tuesday	Institution Civil Engineers Ordinary Meeting, 8 p.m.

BROWN & GREEN'S PATENT SMOKE-CONSUMING KITCHENER



This Kitchener is constructed for burning Ordinary (the smoke being consumed in its passage through the fire, roast in front of the fire. Unsurpassed for Economy, Ge Convenience, Heating Baths, Thorough Ventilation, and Prevention of Smoky Chimneys.

Fitted with Patent Self-acting Damper, which pre waste of fuel.

The GOLD MEDAL and a SILVER MED for GRATES and KITCHENERS at the Sm Abatement Exhibition, South Kensington, 11 and a GOLD, SILVER, and BRONZE MED at the International Health Exhibition, 188

THE 'GEM'

PORTABLE COOKING STOVES.

COALS, 2d. PER DAY.

Slow Combustion Stoves to burn all Night for Greenho Halls, Bedrooms, &c.

Price Lists Free on application.

BROWN & GREEN, Limited,
Makers of the Gold Medal Register & other Sm Consuming Stoves.

LUTON : & 69 & 71 FINSBURY PAVEMENT
LONDON.



BOILING.

PATENT POTATO STEAMER

Honourable Mention at National Health Society's Exhibition,
JUNE 1883.

This invention is designed to meet an almost universal and daily want, viz., the means of cook with certainty and precision all the various sorts of potatoes that are brought to consumers. Experience only teaches that some potatoes will only boil and not steam, and that others will steam not boil. Experiments carefully conducted have failed to discover any sort of potato which cannot successfully be cooked by this new invention.

The inner lining, filled with potatoes, is placed in the bottom of the vessel, with sufficient water to well cover the potatoes; after boiling fifteen minutes, the lining is raised and fixed at the top, and in about twelve minutes, according to size, they are steamed to perfection.

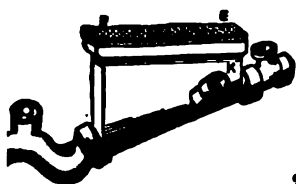
To Cook 3 lbs., 5s. ; 4 lbs., 6s. ; 6 lbs., 7s. 6d.

To be had of any Ironmonger, and Wholesale of the Sole Manufacturers,

GROOM & CO., LIQUORPOND ST., LONDON, E.C.



1	Wednesday	Prince Bismarck born, 1815.
2	Thursday	Harveian Society Special Meeting of Council, 7.45 p.m.
3	Friday	Good Friday.
4	Saturday	Association of Public Sanitary Inspectors Ordinary Meeting.
5	Sunday	Easter Day.
6	Monday	Bank Holiday.
7	Tuesday	Pathological Society Ordinary Meeting, 8.30 p.m.



POTTS'S PATENT EDINBURGH SEWER-TRAP.

Silver Medal, Brighton, 1881.
First Class Certificate, South Kensington, 1881.
GOLD MEDAL, HEALTH EXHIBITION, 1884.

The only Trap which gives entire disconnection between the house drains and the sewer.

The Birmingham Sanitary Association,
28 & 29 UPPER PRIORY (LATE 47 COLMORE ROW), BIRMINGHAM.

SILVER MEDAL, LONDON, 1884. THE HIGHEST ENGLISH AWARD.

NO WASTE. SAVING TIME AND MONEY.

CLARK'S OPTIMUS COFFEE EXTRACT

Makes in a moment a cup or any quantity of fine Aromatic Coffee, which cannot be spoilt in making. It is cheaper and better than Coffee made in the ordinary way; is pure, wholesome, and a valuable Non-Alcoholic Stimulant.

CLARK'S COFFEE EXTRACT

is prepared from the finest freshly Roasted Coffee, by a new and scientific process, whereby the aroma is retained unimpaired. It is absolutely free from Chicory, will keep in any climate, hot or cold, and is the **BEST** and **CHEAPEST**.

INSIST ON HAVING

CLARK'S OPTIMUS COFFEE EXTRACT.

In Bottles, 6d., 1s., and 2s. each.

CHAS. A. CAMERON, M.D., Vice-President and Professor of Chemistry and Hygiene, Royal College Surgeons, Ireland; Vice-President, Institute of Chemistry, Great Britain; Medical Officer of Health for Dublin, writes:—

'I have analysed a specimen of Extract of Coffee submitted to me by Messrs. F. CLARK & CO., of Queen's Road, Battersea, London. It is the best article of the kind which has come under my observation. It is free from Chicory and other adulterants; possesses an excellent flavour, and is a very concentrated preparation. I can strongly recommend this Extract, and intend to keep a supply of it in my house.'

CLARK & CO. 'OPTIMUS' COFFEE WORKS,
QUEEN'S ROAD, BATTERSEA, LONDON, S.W.

CALENDAR

April 8th to April 14th

8	Wednesday	Epidemiological Society Ordinary Meeting, 8 p.m.
9	Thursday	Election of Guardians.
10	Friday	Clinical Society Council Meeting.
11	Saturday	
12	Sunday	First Sunday after Easter.
13	Monday	Medical Society Council Meeting, 7.45 p.m.
14	Tuesday	National Health Society Ordinary Meeting, 4 p.m.

THE 'HARDING' VENTILATING COMPANY,

30 EAST PARADE, LEEDS.

HARDINGS' PATENT AIR DIFFUSER, FOR VENTILATING ALL KINDS OF BUILDINGS.

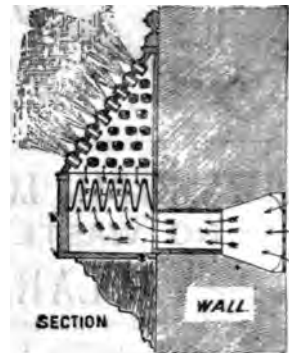


Diffuser with Filter.

Mr. T. PRIDGIN TEALE, F.R.C.S., M.A., Surgeon to the General Infirmary at Leeds, says of Hardings' Diffuser in his book called 'Dangers to Health':—'I am satisfied that by means of this apparatus we can secure in a town freshness of atmosphere, absence of draught, and exclusion of dirt.'

The fresh air is conducted through a grate and aperture in the wall, as shown on section, about 7 feet 6 inches above the floor level; it is then conveyed through the filter, and passed into the room through a series of small tubes placed at an angle of about 30 deg. with the wall.

By these means the currents of air rushing into the apartment are compressed whilst passing through the tubes. The currents of air, as soon as liberated, expand, cut into, and break each other up, and diffuse in all directions so effectually that no draught or chilly sensation can possibly be experienced by the occupants, and at the same time a large volume of pure air is constantly being admitted and dispensed evenly through the apartments.



CHURCH WALL VENTILATOR.—As used in the ventilation of Archbishop Zouche's Chapel, York Minster. The DEAN OF YORK, with reference to the ventilating of Archbishop Zouche's Chapel at York Minster, says:—'I think the ventilation is perfectly successful, and all I have spoken of about it are well satisfied with it, and much pleased with the result.'

OUR PATENT EXTRACTOR is the best in the Market, and is supplied at a very much lower price than any other.

CHURCH WINDOW VENTILATOR.—These Ventilators are used for Churches, Chapels, and other Public Buildings where it is not desirable to have holes cut through the walls to admit air in the usual manner. The appearance is not more noticeable than the ordinary Hopper Ventilator so frequently seen.

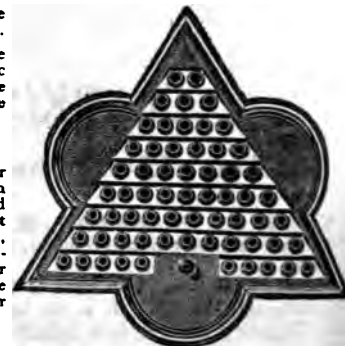
'Armley, Leeds, Oct. 29, 1883.

'Gentlemen,—I have pleasure in stating that in my opinion your system of ventilation, introduced in our Church this summer, is a decided success. Heretofore when the Church has been well filled at the Evening Service, I have been almost exhausted by the effort of speaking before I have got half through. On Sunday night, October 7, at our Harvest Thanksgiving, we had a very large congregation, and I preached without the least feeling of weariness or exhaustion. I shall be glad to hear that your Air Diffusers are being widely adopted. I am, yours truly, JOHN GREGORY, Minister of Oak Road Congregational Church, Leeds.'

These Ventilators are more suitable for Schools, Warehouses, and other Buildings where cheapness is an object. The result is precisely the same as in our other styles, at a very much smaller cost.



Air Extractor.



Church Wall Ventilator.

A reduction in price is made where a number of Diffusers is required. Estimates and further information given on application to the 'HARDING' VENTILATING COMPANY, 30 EAST PARADE, LEEDS.

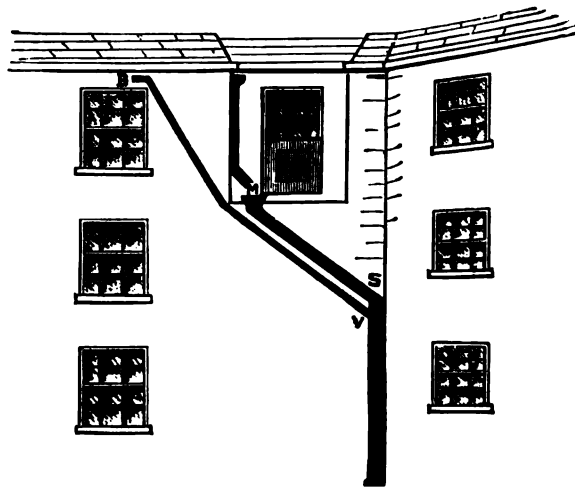
LESS FROM DEFECTIVE PLUMBING.

By MAURICE DAVIS, M.D.

membranous deposit on both tonsils, b-maxillary and cervical glands, rapid high temperature, induced close question at the drains. The answers evoked led nation, and this, in its turn, revealed the state of things, in a large house in one of central squares. There had been frequent from an offensive atmosphere, especially in part of the house, and the chief sufferer sore throats was the cook. The children in number, before the present seizure experienced any alarming illnesses, and less than their share of measles and but the wife of the previous occupant, ten years ago, had died of scarlatina. Adding the presence of the patient, the commenced, for it seemed to involve less the leakage, and thoroughly dilute the sewer-gas at its source, than to force its way through the numerous open defective system into nearly every room in the house. Before, however, anything the main drain of the house was disconnected the sewer by means of a syphon-trap. Whenever there is a bath in a house be suspected, and in this case that danger realised, for the waste water-pipe was with the trap of the upper closet, and was

but bell-traps had been used to break the direct connection of the sinks with the drains, and these were in the usual abortive state. The waste-pipes of the cisterns had been corrected some years ago, at the instance of the water company. Rats had, by their presence long ago, intimated serious defects, but as they did not enter the house in droves, but confined themselves chiefly to the area, their friendly warning was disregarded. The rain-water pipes were now surveyed, with little expectation of finding any glaring errors, as it was stated they had been recently examined, but expectation was sadly disappointed. At the back of the house was observed a large pipe, opening upon leads on the nursery floor.

This served a double purpose, for a little lower down at S, it was seen to enter the wall of the next house, where it did duty also as a soil-pipe. It is true it was ventilated at V, and this was probably the type of the recent correction above referred to; but this piece of $\frac{3}{4}$ -inch lead pipe discharged its gas just above the window of the bedroom at B, which had been, up to this time, occupied by the sick boy. On closer inspection the mouth M, intended to receive the rain-water from the roof, had been fitted with a bell-trap, but the bell had not been heard of within the memory of living man. Such being the present state, steps were hastily taken to correct it, and accordingly the two perforated soil-pipes were renewed and the new ones carried up with open extremities above the roof; the old brick drains were made to give place to glazed earthen pipes of 6 inches and 9 inches diameter, the cess-pool and saturated earth were removed, the water-pipe of the bath (itself ventilated above the roof) was



locked. The closets themselves were and the soil-pipes in both cases were in places throughout their course. That closet passed down the wall of the wine-cellar with its sewer-gas the bouquet of the vents, and finally discharged itself into a drain beneath the stones of the cellar. with wasted mortar, and therefore gaping between the bricks, passed into the area and two sides of this corner house. A ver, formerly communicating with the house, was found full of decomposing a cesspool was discovered in the side to the door of the coal-cellar. Nothing

made to discharge itself into a gully beneath the pavement of the wine-cellar, and this spot, being the highest point of the drain, was ventilated by a 4-inch pipe continued to the height of the house. The sinks were all separated from the drain, and made to discharge into the open. The rain-water pipe was disconnected from the soil-pipe of the adjoining house, and, like the others, was carried upwards to the regulation height.

AN outbreak of small-pox has occurred at Alnwick, and the authorities are making preparations for the erection of a hospital, in order to procure the better isolation and proper treatment of patients.

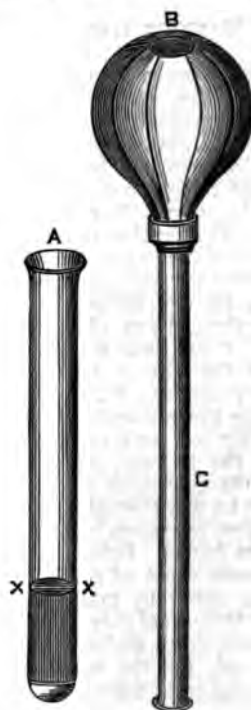
A SIMPLE METHOD OF TESTING THE PURITY OF AIR.*

IN view of the well-known fact that breathing impure air tends to render even healthy and robust people liable to the attacks of disease, while undoubtedly it many times causes serious illness and death to those of a weak constitution, it seems extremely desirable to have some simple test by which, without the use of complicated chemical testing apparatus, a knowledge may be gained as to the degree of pollution by respiration and cutaneous perspiration of the air in living and sleeping rooms, as well as in offices, schools, factories, hospitals, &c. A test which could be easily made would also be of much service to architects and engineers, in order to ascertain the efficiency of systems of ventilation in buildings old and new. It would be of greatest importance to learn, by means of a chemical analysis, the amount of organic impurities in the atmosphere, for these have, by the investigations of physiologists, been demonstrated to be the principal vehicles of disease. Unfortunately, such a test is not available, and all we can do, at present, is to ascertain the amount of carbonic acid due to respiration; and, assuming that there is a certain fixed proportion between the latter amount and the organic impurities, make the carbonic acid present in the air the measure for its impurity. It is not difficult to find, by chemical analysis, the amount of carbonic acid contained in a given volume of air. Many such tests have established the fact that the atmosphere which we breathe contains, on an average, about 4 parts of carbonic acid in 10,000 parts of air. Pettenkofer and others ascertained that if the amount of carbonic acid exceeds 7 parts per 10,000 parts of air, the latter becomes too impure to be breathed any length of time without injury to health, not as explained above, on account of the increased carbonic acid impurity, but because, with the latter, the amount of exhaled organic impurities becomes too large.

A very simple apparatus for making this test is the one invented by Prof. Wolpert, of Kaiserslautern, Germany. Its essential parts are first a small cylindrical glass tube, A, 12 centimetres ($4\frac{1}{2}$ inches) long, and 1.2 centimetres ($\frac{1}{2}$ inch) in diameter, with a white bottom, on the inside of which is placed a black mark (the figures 1882). The cylinder has a mark (XX) on its side at a height from the bottom corresponding to just 3 cubic centimetres contents, which indicates the quantity of clear lime-water to be poured into the cylinder at each test. The other piece is a glass tube, C, firmly attached to a rubber handball, B, which has a capacity of 28 cubic centimetres, and which is used to press bubbles of air through the clear lime-water until the latter becomes so turbid that the mark at the bottom of the glass cylinder becomes invisible.

During this operation the cylinder is held in a small wooden foot-rest. Before passing any air through the lime-water, the rubber ball should be repeatedly squeezed, to make sure that it contains a fair sample of the air in the room to be examined. Upon inserting the small glass tube into the cylinder, care must be taken, lest in squeezing the rubber ball a portion of the lime-water is lost by running over the top of the cylinder. After each squeezing of the

ball, remove the tube from the cylinder, taking that no lime-water is sucked up by the ball, all



rubber ball to refill with the air to be tested repeat the operation until a marked turbidity of lime-water is apparent. Each apparatus is tested by Professor Wolpert before being sold, and a table is furnished, in which is given, opposite number of squeezes of the rubber ball, the corresponding amount of carbonic acid in the air. For instance, if fifty squeezes are required, this indicates four parts of CO_2 ; if forty squeezes, five parts; if thirty squeezes, 6.6 parts CO_2 ; if twenty squeezes, 10 parts CO_2 per 10,000 volumes of air, and so on.

The table begins with one squeeze, corresponding to 200 parts CO_2 in 10,000 volumes of air, and extends up to sixty squeezes, corresponding to 3.3 parts CO_2 in 10,000 volumes of air.

The test can be very readily made by laymen, and gives information accurate enough to enable one to judge of the sufficiency or insufficiency with which the air of a room is renewed. It would have great value to have such an appliance as that described in all school-rooms and hospital wards, to be frequently used by the teachers and the patients respectively.

ISOLATION AND DISINFECTION.—Small-pox has recently been very prevalent at Pudsey, near Bradford, Yorkshire. At least a dozen cases have been sent to the Hospital, under the care of Dr. Hime. The Town Council of Bradford has written to the Secretary of the Local Board, pointing out the great danger which in that district from lack of proper means of isolating patients and disinfecting clothing, &c. At a special meeting of the Pudsey Local Board, it was agreed to erect cottages, near Swalewell Mill, for the purpose of isolating patients, and also to erect a disinfecting apparatus at the same place.

* Reprinted from the American Building.

THE SANITARY RECORD.

MARCH 16, 1885.

or will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers before the members of any sanitary or kindred association.

Authorities throughout the country confer a favour on the EDITOR of the SANITARY RECORD by forwarding to him all communications relative to Water-supply, Sanitation, Health matters generally, which come under his notice. He would also be glad to receive communications from Engineers of Waterworks, Sewerage, and Domestic Drainage Improvements, and to comment, and illustration.

RAILWAY FACILITIES FOR ARTISANS.

It has been said at recent half-yearly meetings of the great railway companies about the effect of bad dividends with the shifting of second-class travellers into third-class. There is a grave question of public policy underlying cheap means of locomotion which perhaps present itself very forcibly to a directors compelled to meet its constituents' announcement of a decreased dividend, which must be reckoned with nevertheless. Not only we drew attention to the supreme importance of the future welfare of this huge and ever-metropolis that abundant facilities should be afforded to artisans for planting their homes in the suburbs of the town, away from the reeking and crowded courts of central London. The Government to a certain extent appreciated the importance of the matter by giving special prominence to the evidence taken before the Royal Commission on the housing of the working-classes, and offering a bonus in the shape of a reduction of income tax where cheap trains have been introduced. But the railway companies of themselves have done little or nothing, although there appear to be obvious advantages to themselves in attracting colonies of artisans to the neighbourhood of their stations.

And many statistics are annually published about railways, but there appear to be none giving about third-class season-tickets. Season-receipts are usually lumped together, and there is no means of telling in what proportions the different classes avail themselves of this privilege. The growth of third-class traffic, taken as an index sufficiently accurate for our purpose, shows the extent to which railway travelling has become a necessity of the artisan as well as of the farmer. In the year 1873, when the new policy of giving third-class carriages on express trains had

just come into force, 32 millions of first-class passengers, 63 millions of second-class, and 306 millions of third-class, or 401 millions in all, travelled by railway in England and Wales. In 1883, 30 million first-class, 59 million second-class, and 523 million third-class passengers were carried. Thus, while the numbers of first and second-class were practically stationary, upwards of 200 million more third-class were carried. The receipts per mile of railway open were, in 1873, 324*l.* first, 303*l.* second, and 874*l.* third-class; and in 1883, 227*l.*, 216*l.*, and 1,113*l.* respectively. As compared with 1873, there was, for the whole kingdom, in 1883, a decrease of 703,000*l.* in the first-class receipts, and of 655,000*l.* in the second-class receipts; but an increase of 5,300,000*l.* in the third-class. The receipts from third-class traffic are now much more than double the receipts from first and second-class traffic combined, and in a very few years will be thrice that amount.

We have set out these figures, the relation of which to the housing of the poor may at first sight appear slender, with the object of showing that the third-class traveller is a personage whom the managers of railways must reckon with, and whom they must indeed bow their lordly necks to serve. A railway magnate's gorge may rise at the painful necessity of providing accommodation for the artisan and labourer; but where without the third-class receipts would be the dividends which it is the special object of the chairman's heart to keep at a respectable level? The days have gone by when it was possible to artificially drive people into higher-priced compartments, by making third-class trains the slowest and the most inconvenient that the general manager could devise. That company will thrive the best in the long run that adopts a policy of conciliation and of encouragement to its third-class constituents, and puts them on an equal level as regards privileges with the first and second-class travellers.

One of the chiefest of these privileges is the issue of third-class season-tickets. On what principles of justice can such be denied? When it is argued that the miserable squalor and overcrowding of the London poor could be relieved if the better class were to migrate to the suburbs, the natural question at once arises, How are such people to get to and from their work? London is pierced in all such directions by railways, and the conveyance of these suburban dwellers would be easy enough if the season-ticket system was fully extended to third-class passengers. Most people will be surprised to learn that this has been done on only one of the metropolitan lines. At present, excepting on the Midland Railway, the state of the case is this: if a third-class passenger, who is not in a position to avail himself of the workmen's trains that run at unearthly hours of the morning, travels daily to and fro between two stations, he pays at least as much by the end of the year as a first-class season-ticket holder. In our last reference to the subject we drew attention to the case of Noel Park, on the Great Northern Railway. It completes an argument, and there can be no harm, therefore, in citing it again. The Artisans, Labourers, and General Dwellings Company are building at Noel Park, ten minutes' walk from the Hornsey Station on the Great Northern line, 2,600 houses, 1,000 of which will be let at 6*s.* and 7*s.* 6*d.* per week. The 6*s.* house contains four good rooms and a scullery, has a front and

back garden, and the rent includes all rates, taxes, and water. There are also some double tenement houses in which a living room and two bedrooms, sufficient accommodation for a small family, can be had for 4s. 6d. a week. But the Great Northern Railway compels the poor man, unless he is willing to leave his house before five o'clock in the morning, to pay 4s. a week to get to this excellent home. It is needless to say that this price, which is 33 per cent. more than the cost per week of a first-class season-ticket, is prohibitive in most cases.

What is required is, in the words of Mr. Farrant, the Managing Director of the Artisans' Dwelling Company (than whom no one is more competent to express an opinion on the subject), the extension of the season-ticket system to the third-class passengers. Justice seems to demand this. No reason can be given why the poorest class of the community should be excluded from the benefits of a system of the conveniences of which they stand in far greater need than anyone else. If a season-ticket is a cheap luxury to a rich man, it may be said to be, from the 'Dwellings' point of view, a necessary of life to the poor man. The railway companies have it in their power to develop a traffic which could hardly fail to prove, at any rate eventually, very extensive and remunerative; while, at the same time, they would be doing more to solve the difficulty of housing the working man than could be done by any other step that could be mentioned.

That there is nothing impracticable in this suggestion here made is shown by the example of the Midland Railway. This line, as is well known, has no second class, but its first and third-class passengers are treated with perfect equality with regard to season-tickets. We sincerely trust that the Royal Commission will see their way to some strong expression of opinion on this very important question, and the draft report of the Commission, which has somehow slipped into the hands of the *Standard*, appears to give promise that such will be the case.

A YEAR'S WORK.

'THE diffusion of a knowledge of the laws of health amongst all classes,'—this is the purpose constantly kept in view in the working of that most useful body, the National Health Society, the twelfth annual report of which gives an interesting account of what was accomplished during the year 1884. It is impossible to estimate how much good is done by a single lecture, how many from the audience go home impressed with ideas of the responsibility of guarding their own health and that of their families and neighbours, or how large a proportion are led to take some practical steps towards carrying out the maxims that they have imbibed. If we could reckon the average results proceeding from one lecture we should have to multiply them a hundredfold in order to represent the benefit which has accrued from the work of the National Health Society in this direction. During the past year one hundred lectures upon simple sanitary subjects have been delivered by seven of the society's lecturers in thirty-two distinct parts of London and in eleven provincial towns. Large audiences of all kinds have been provided for, and the useful practical hints have been much appreciated.

With regard to the literary portion of the society's work, several popular penny books were published

during the year, of which large numbers have been sold and distributed. A pamphlet on 'How to Oppose and Prevent the Cholera' has been drawn up, and 27,000 copies sold. The society's stall at the International Health Exhibition was a decided success, about 1,500 of the small books and leaflets being sold weekly; and, in recognition of the value of its publications and general work, the council awarded to the society a diploma of honour. Another feature of the society's work at the Exhibition was the Conference on School Hygiene, which was arranged under its auspices and lasted six days. Several new corresponding members have joined the society during the year, and the sanitary associations in Hull and Keighley are now affiliated with it. Prizes have been awarded to four girls in the North London College for proficiency in a knowledge of the laws of health. The sub-committee for investigating arsenical and other poisons in domestic fabrics has also been actively at work. Thus the society is one that steadily works for the welfare of the people, and, while dealing with questions of great national interest, it goes into the home of the poorest citizen and there works wonders.

ELECTIONS TO BOARDS OF HEALTH.

ELECTIONS to Boards of Health will be held this year under new conditions. Most of the provisions of the Municipal Elections Corrupt and Illegal Practices Act of 1884, 47 & 48 Vict., c. 70, are applied to elections for local boards, and candidates and their supporters will do well to attend to those provisions. The mode of nomination, qualification of voters and number of votes to which they are entitled, and collection of votes by means of voting papers remain as before. The expenses of these elections also continue to be charged on the rates, and consequently the provisions of the new Act, which limit and regulate the expenses of a candidate (who is not supposed in an election for a local board to spend anything) are not applicable. Treating, undue influence, and bribery are now declared to be corrupt practices; and if a candidate is found to have been guilty of such practices by his agents he is rendered incapable of holding any corporate office in the district for three years; while if it is proved that bribery has gone on with his knowledge and consent, or that he has himself treated or used undue influence to any voter, he is disqualified for ever. The Public Health Act imposed a penalty of 20s. fine or three months' imprisonment on certain offences, such as fabricating voting papers, personating voters, or interfering with the collection or delivery of voting papers. These offences are now defined to be illegal practices, and certain other acts, such as voting when prohibited from doing so, publishing a false account of the withdrawal of a candidate, &c., are also defined to be illegal practices. The penalty for these practices is now 100s., and the person convicted is further rendered incapable of voting at any election for five years from the date of his conviction. If a candidate is guilty of an illegal practice by himself or his agents, he is disqualified for holding any corporate office during the period for which he was originally elected; and if he is himself guilty of such practice, he is further liable to the penalties above stated. Payment or promise of payment in order to induce a candidate to withdraw is declared to be illegal; so is the

nt of more than a limited number of d those employed must not vote ; so also is a committee room, or for holding meet- emises licensed for the sale of intoxicating where such liquors are supplied to the of a club, society, or association. Any iltly of an offence of illegal payment, em- or hiring, is liable to a fine of 100*l.* ; and ence is committed by or with the know- onsent of a candidate, he is guilty of an ctice. An election is liable to be declared a candidate to be disqualified from holding egal practices or offences of illegal payment, nt, or hiring have prevailed so extensively may reasonably be supposed to have in- he election, even though the candidate is not have connived at them in any way. Certain ovisions, such as that which requires every rd, or poster to bear the name and address rinter, also apply to elections for local out the above *résumé* is sufficient to indi- nain points to which candidates and voters ct their attention.

ge of procedure which has been made by ay, however, influence the manner in which are held quite as much as the above to increased penalties. Hitherto it was difficult to question the return of members to have been elected on local boards. No machinery was provided, and a dissatisfied e had to apply to the Court of Queen's r a certiorari to quash the proceedings, or adamus to the returning officer to declare ted. Such proceedings were dilatory and a, and seldom succeeded, and consequently en rare for the reports of returning officers ously disputed. Now all this is changed, iries as to elections are to be commenced on and conducted locally before a barrister d to hold such inquiries, in the same way as into municipal elections are held. Such , of course, cost money, but the expense e necessarily be very great, nor need it fall petitioner. Candidates who feel aggrieved ult of an election are much more likely to and so have everything inquired into, than e to apply to the Queen's Bench formerly. who are inclined to disregard the strict ents of the law are consequently not un-) find those requirements enforced and s inflicted ; and the Act which imposes those enalties is much more likely to be effective former Act was, which only imposed minor s. Elections to local boards are now often ed on political lines, and the need for sub- them to the same restrictions as other elections has consequently arisen. Ex- : only can show whether candidates or voters osed to conduct these elections in accord- h the new law ; but, if they do not, they may d their actions productive of serious conse-

at last meeting of the Association of Public Sani- tectors, Mr. G. B. Jerram presented, on behalf of ciation, a handsome purse to Mr. Samuel C. e honorary secretary of the Association, contain- eque for twenty guineas. In his reply Mr. Legg the members for the kind manner in which they ys received his efforts, and said that he valued ly the feelings which had prompted such a testi-

NOTES OF THE MONTH.

VACCINATION PROSECUTION BY WHOLESALE.

IT is a standing marvel how the good but obstinate people of Leicester manage to escape the epidemic of small-pox which appears to be their due for their wholesale disregard of vaccination. The guardians have been allowing the arrears to accumulate for years without making any effort to secure obedience to the Vaccination Acts ; and now that they are at last compelled to perform their duty, they find the task very much beyond their powers. For what is to be done when 5,000 separate people have to be prosecuted, and prosecuted at least twice each ? Their very number gives them strength and solidity to resist what they misguidedly believe to be a ' dangerous ' operation ; so that people who—dealt with in detail—would have turned out to be merely dilatory and careless about vaccination, are now found to swell the enthusiastic ranks of the most ardent anti-vaccinators, and to be quite ready to endure a little cheap martyrdom in order to attract the admiration of their fellows. This vaccination prosecution in bulk is a sorry and distressing business, on which we shall not further comment. But there are one or two points in connection with the law on the subject which seem to be curiously misunderstood, and as to which, therefore, a few words of explanation may not be out of place.

The omission of a parent to secure the vaccination of his child was first made an offence by the Vaccination Act of 1853. But no officer was appointed by the Act whose business it was to set the law in motion, and the terms of the section relating to proceedings were such that it was held by the Court of Queen's Bench that a parent could not be convicted a second time for neglecting to have his child vaccinated. In the well-known case of *Pilcher v. Stafford*, tried on January 27, 1864, Lord Chief Justice Cockburn remarked that there was no provision for a second notice, and the Act did not meet the case of a continuance of neglect. The continuous omission might be as much within the mischief as the failure to have the child vaccinated within the prescribed time, but it was certainly not met by the statute. This, however, could only be remedied by fresh legislation. Parliament took its time, however, in correcting this anomaly ; and it was not until 1867 that a further Act was passed. By the Vaccination Act of 1867 the obligation is imposed upon the parents of all children in England of having them duly vaccinated within three months of birth (Section 16) ; or, in scattered districts, where public vaccination is performed at intervals of more than three months, when the opportunity of procuring public vaccination has been afforded (Section 12). Neglect to take the child for vaccination within this period is an ' offence ' for which the parent can be proceeded against summarily, and for which he is liable to a penalty not exceeding twenty shillings (Section 29). It will be observed that this offence is complete at the end of the three months or other period, and as therefore it can only be committed once, only one penalty can be inflicted on account of it.

Under Section 31 of the same Act, however, an order for the vaccination of a child under fourteen years of age may be made by a justice of the peace if he sees fit upon the application of the vaccination

officer; and such order may be renewed or repeated again and again, as often as may be requisite, until the vaccination of the child is effected. This is not, it is true, said in so many words in the section, but it is the view of the clause which has invariably been held, and it has been distinctly confirmed by the Court of Queen's Bench. It was held by Lord Chief Justice Cockburn, in the case of *Allen v. Worthy*, that a person was rightly convicted for disobeying a second order, requiring him to have his child vaccinated, notwithstanding that he had been already convicted of disobedience to a previous order. He said: 'It is clear that, if Section 31 had not been introduced, the decision in *Pilcher v. Stafford* would have applied; but I think that that section makes all the difference as regards what may now be done with respect to a second offence and a second penalty. I think, therefore, that the power given by Section 31 is not confined to one notice, one order, and one conviction, but that the whole proceeding may be instituted *toties quoties*, so long as the disobedience continues.'

What is now being done at Leicester is to prosecute the 5,000 recalcitrants under Section 29, and if they disobey the order for vaccination to summon them again under Section 31.

Evidently the local vaccination officer and clerk of the guardians have their work cut out for them for some little time to come.

THE FALLACIES OF WATER ANALYSIS.

A REMARKABLE case claimed the attention of the Canterbury Bench of Magistrates a short time ago. A tradesman was summoned by the Town Council with a view to obtain an order for closing a well upon his premises alleged to be polluted. The city analyst appears to have reported last June that a sample of water taken from the well was contaminated, and an order to provide a proper supply was thereupon served. But the defendant astutely sent of his own accord a sample of the water to the analyst, in such a way that the latter was deceived as to its source, and in due course the sample was pronounced pure and suitable for drinking purposes. Dr. Dupré, the Government analyst, reported of the water that it contained a very high percentage of phosphoric acid, and showed signs of pollution by sewage or surface drainage, and might at any time become deleterious to health, though he refused to analyse a sample sent by the defendant, because the district from which it came was not stated. The city analyst, in examination, observed that, knowing as he now did that the water previously reported as pure came from a Canterbury source, he should consider it unsafe for drinking purposes, as liable to contamination; and thereupon the Bench ordered the well to be closed. There seems to be but little doubt that the water is, as a matter of fact, unfit to drink, but the defendant in the case may well have hesitated to obey the mandate of the local authority in view of the contradictory reports of the analyst. The common sense of the verdicts of water-analysts was well expressed a year or two ago by the medical officer of the Local Government Board in his comments on some analyses of water intentionally polluted under his direction, when he said that 'whilst we must ever be on the watch for the indications that chemistry affords of contaminating matters gaining access to our waters, we must go beyond the laboratory for evidence of any drinking-water

being free from dangerous organic pollution. If the chemist is well acquainted with the original liabilities of the water he is examining, he is justified in speaking of a water as "safe" or "unsafe" if it contain any trace whatever of organic matter; hardly, indeed, even if it contain absolutely none of such matter appreciable by his very delicate methods. The chemist can, in brief, tell us of purity and hazard, but not of purity and safety. Information about these we must go, with the chemist, to the search of the conditions surrounding water supply and affecting water services.'

ARSENICAL FLOORS.

SIR EDMUND BECKETT calls attention in the *Times* to the suggested application of a solution of arsenic to the woodwork of a floor to the disinfestation of a church, and *this* time the critic's objection seems valid. The dangerous nature of such a preservative is so well known that it seems strange that its use should be countenanced by the architect, as it can hardly be supposed that a substance of so volatile a nature could be used without danger. In the first place a harmless agent, such as creosote, could be used instead, but the question naturally arises, why use a preservative at all in timber in such a position? Natural ventilation of the floor should be sufficient to prevent 'dry rot'; the wood be primarily sound and dry as ordinarily understood, and if the timber be in such a position as to necessitate 'preserving' there is every probability of a fungoid growth being set up, arsenic notwithstanding; the danger then becomes greater, as 'rot' is a fungus flourishing in damp and stagnant air; consequently a greater chemical action must be brought about. If the church be heated as by hot air or water, the volatile products of arsenic would find ample outlet through grates and apertures into the body of the edifice. The employment of such an objectionable substance therefore, is unnecessary and wrong, and certainly not dreamt of in the philosophy of general architectural practice, and we are pleased to understand that timely notification has prevented any commission of the error.

MANSLAUGHTER BY NEGLIGENCE.

HUMAN life, especially that of infants, is constantly exposed to danger by the neglect of persons from their position, are bound both morally and legally to be careful. Sometimes coroners' juries find that a mother has been so culpably reckless in her conduct towards her infant that they return against her a verdict of manslaughter, or the charge may in like manner be brought against a nurse who has charge of a bedridden patient, or against a person on whom a helpless relative is dependent. Lawyers have no doubt on the rule which is applicable in such cases. 'If a person has the custody of another who is helpless, and leaves that other without sufficient food' (or without necessary care, if in a position to give it), 'and so causes death, he is criminally responsible,' or, in other words, is guilty of the crime of manslaughter. But though the law is clear, its application to the circumstances of a particular case is not unattended with difficulty. It would be impossible to lay down any general rule as to the relationship between persons which shall

always impose a duty of care or attention, or as to the degree of neglect where criminal culpability begins. Those are questions of fact to be determined with reference to the circumstances of each case. Our law imposes on those who institute a prosecution the duty of satisfying a jury that the person accused is guilty of the crime with which he is charged. In the case of a charge of manslaughter by neglect, the prosecution have consequently to satisfy the jury that death was caused by reason of the neglect of the prisoner to provide some sustenance or care for the deceased, which it was his duty to provide. Sometimes the prosecution fail to prove that the relative position of the parties was such as to impose a duty at all; more often they fail to satisfy the jury that the negligence of which the accused has been guilty was culpably reckless. It is excused as being perhaps the result merely of ignorance or thoughtlessness; the accused is given the 'benefit of the doubt,' and so is acquitted. From the above reasons and from others upon which we need not here enlarge, prosecutions for manslaughter by neglect are seldom successful; and, knowing this, coroners are often unwilling to have such prosecutions instituted, and dissuade their juries from returning verdicts of manslaughter unless the neglect is so culpable as almost to make it probable that it was intentional, in which case the crime committed is murder. But though trials for manslaughter by neglect, especially for manslaughter of infants, are rare; there can be no doubt that infant life is often sacrificed, and still more often endangered, by negligent conduct on the part of mothers and nurses, which is not only morally culpable, but would also be held to be criminally so if the facts were fully known. It is not likely that anyone will propose to alter the law as to criminal responsibility for neglect, and it is not desirable that it should be altered. The difficulty of proving any one guilty of manslaughter by neglect must remain a difficulty, which those who institute a prosecution must be prepared to meet. But at the same time, in spite of the risk of failure, we think it most desirable that, in what seem to be proper cases for investigation, prosecutions for manslaughter should be instituted. Even where they fail, they direct attention to the rule that no one may neglect helpless persons dependent upon him, and, by showing that serious criminal consequences may ensue, they act as a deterrent, not only on really criminal neglect, but also on merely careless conduct, which might still be productive of serious consequences if allowed to continue.

TURNING A DESTRUCTOR TO PROFIT.

THE problem of how to get rid of refuse from towns is, as everyone knows, one of the most difficult of those which occupy public attention at the present day. Various methods, more or less successful, have been tried, but all of them have been expensive. An experiment, which is now being carried on by the Rugby Board of Health, makes it seem probable that under favourable circumstances solid refuse may be disposed of so as to produce a profit instead of a loss. Many towns have adopted some form of destructor or kiln in which solid refuse is burned, and so rendered innocuous. The Rugby Board thought of doing so likewise, and made inquiries at various places where destructors were at work. The result of these inquiries showed that the cost of

erecting an efficient destructor of the patterns already in use was more than the Rugby Board, representing a rather small district, felt justified in incurring. Mr. Seabroke, a member of the Board, and Mr. Stewart, the surveyor, who had inspected some destructors in actual operation, noticed that the one thing indispensable for their proper working was a chimney which would produce a good draught. They, accordingly, determined to try whether, when mixed with coal, the rubbish removed from dust bins would not burn in the furnace of the engine at the waterworks belonging to their town. At first the trial seemed successful, but soon the rubbish formed clinkers to such an extent as almost to put the fire out, and thus render the boiler useless. The fire space in the boilers was also too small, and only capable of burning a small part of the ashes which had to be got rid of. Messrs. Seabroke and Stewart, however, obtained permission from their Board to erect a kiln or oven of ordinary brick connected with the boilers and with the chimney of the engine. This was done at a cost of 20*l*. The kiln was found to burn the rubbish much more effectively than the boiler furnace had done, and satisfactorily disposed of what was put into it, leaving a residue of clinker and ashes which could be utilised for roads. But it was also found that the ashes when burned in the kiln were useful as fuel. The engine in question is used for pumping water from the waterworks, and is supplied by two boilers. One boiler hardly makes sufficient steam to do the work, and when only one is used it has to be liberally supplied with coal. The experiment was tried for some time of only using coal for one boiler, and of heating the other by the rubbish in the kiln; and the result was found to be that the consumption of coal requisite in the one boiler was much less than before, and the engine did its work satisfactorily. According to the report presented to the Board, the cost for fuel, when the engine was worked with one boiler fed with coal, was .79 of a penny per 1,000 gallons pumped, and when that boiler was aided by the steam from the other boiler, heated only by the refuse, the cost per 1,000 gallons was reduced to .61 of a penny. There was thus a very appreciable saving in the coal bill. The above calculation does not allow for the wages of the man employed to attend the destructor; and in the Rugby experiment these wages would add materially to the cost of getting rid of the rubbish, because one kiln did not fully occupy his time. But, if a second kiln were added, the expense for wages might remain the same, and double the quantity of rubbish be utilised. It must also be remembered that, however a town disposes of rubbish, some expense for labour is always necessarily incurred. The Rugby experiment seems to be a material step in the right direction, and to show that rubbish may be disposed of in a manner consistent with sanitary rules, and at the same time without loss to the ratepayers.

VENTILATION AT THE LAW COURTS.

IT is admittedly difficult to please everyone, and the question of ventilation appealing to various susceptibilities is rendered none the less easy when the occupants of a room are removed from time to time, as is the case at the New Law Courts, where much remonstrance has recently been occasioned by more than one judge. It appears that the ideas

in the judicial mind as to what constitute a pleasant temperature vary some ten degrees, and the officials of the 'office of works,' who have charge of the ventilating arrangements, are frequently called upon at short notice to raise or lower the temperature accordingly. The rule adopted for regulating the work is to know in the evening which (particular !) judge will sit in such and such a court on the following morning, and to arrange the necessary warmth to suit, but as the judges change courts during the day, a further alteration has to be made, hence the individual dissatisfaction. There are nineteen courts to be thus attended to, and the rapid displacement of air is expected to be brought about without draught or inconvenience, and accordingly the principle of the whole system is condemned, one judge going so far as to enjoin that the apertures should be pasted up, in the hope that it would disarrange the entire scheme, and that no attempt should be made to ventilate his court at all. This is an unfair tax upon science, or rather a hopeless attempt to make natural causes immediately subservient to several conditions at one time. The ventilating machinery is under control, and, given equitable and reasonable conditions, the resources of science are sufficient to cope with understood requirements, but in this case the requirements are changed so often that they do not appear to be understood even by the parties most interested, and from whom justice at least is expected.

HALFPENNY DINNERS FOR SCHOOL CHILDREN IN BIRMINGHAM.

WITH a view to meeting the difficulty experienced by the committee in reaching those children who are most in need, by means of the penny dinner scheme, experiments have been started in the direction of providing a mid-day meal, of a substantial and nourishing character, at a charge of one halfpenny. This experiment is being conducted at the Wycliffe School, St. Luke's Road, by the sub-committee which formerly had charge of one of the penny dinner centres, and eight schools are covered by the scheme of operations, namely, St. Jude's, St. Asaph's, St. Luke's, St. David's, and St. Alban's (all church schools), and the Bristol Street, Hope Street, and Rea Street Board schools. On the first day the halfpenny charge came into operation there were 303 present; on the next day the number had increased to 508; and on the following day to 566. The dietary at these halfpenny dinners is made up from the experience obtained in connection with the penny dinner scheme. It is found that there are some children who cannot eat a certain article of food, and two courses are therefore provided, one being a stew or bacon sandwiches, and the other bread and jam or bread and cheese. Seats are provided in the schoolroom for about 150 children, and as the average daily number to be fed is about 500, they have to be served in relays. As they enter, each child receives a bowl and a spoon, and it then passes to a lady to receive a portion of bread, and to other members of the committee or helpers for the stew, sandwiches, or whatever may be the article on the dietary table for the day. This only applies to the first course, the second being served as the children leave. The results so far show that there need not, with proper management, be any loss even at a charge of one halfpenny. In order to

encourage attendance at school the tickets are distributed in the respective schools by the teachers. It is considered that the movement can be made a powerful auxiliary to the School Board visitors. In a town like Birmingham there are hundreds of wretched children who wander about the streets and pick up food as best they can. They are under no parental control other than that which compels them to beg or steal, and it is found extremely difficult to bring these wanderers under educational influences. It is thought probable, however, that a goodly portion of them might be tempted to attend school if they were certain of a good meal during the day, and there is no doubt some philanthropic agency would be found to purchase the necessary tickets for distribution in such cases. The line between the free dinner, which means charity, and that for which a sufficient charge is made to enable the hunger of the recipient to be satisfied, has now been drawn about as finely as it can be. But as the halfpenny dinner undoubtedly reaches a class between those who cannot pay at all and those who can afford a penny or more, it is to be hoped the scheme will be found successful.

FIRES IN THEATRES.

THE entire destruction by fire of the Exeter Theatre calls further attention to a subject which is frequently brought to notice, and upon which many a homily has been written, so far, however, without any serious attempts being made to grapple resolutely with the grave danger. The Exeter Theatre was burnt down some eighty years ago; but this comparatively long immunity is no excuse for allowing these buildings to remain, as they mostly are, a trap for the thoughtless and ignorant, or a still larger class, the careless. The flames broke out fortunately when the building was empty, viz., at six o'clock in the morning, and in the course of an hour only the walls remained, these walls not being sufficient to protect the adjoining property, which became ignited, but happily the flames were extinguished before any great damage was done. The average life of a theatre has been shown to be twenty-three years, and when it is known that an average nightly attendance at 472 places of public amusement in London is recorded at over 300,000 people, the appreciable risk may be estimated by playgoers themselves, and an uncomfortable speculation may be pardonably and perhaps profitably indulged in as to which building may be next on the problematic list. According to the statement of the consulting engineer to the Metropolitan Fire Brigade, the loss of nearly 1,000 lives by the fire at the Ring Theatre at Vienna in 1881, caused the Metropolitan Board of Works to beset themselves, and exercise the powers granted to them by Parliament in 1878, and Captain Shaw was instructed to draw a report showing the condition of theatres under their jurisdiction. It does not appear that this report was made public, presumably on account of its terrifying nature, and the pertinent question is put as to which is of greater importance, to alarm the public or to burn them alive? It is the Lord Chamberlain's business to prescribe regulations for preventing the blocking of the gangways, the working order of the fire-extinguishing appliances, the protection of stage and other lights, and general provisions for public safety, and the damaging statement is made that the day is done by annually sending a gentleman, who has

no practical knowledge of fire appliances, to inspect the theatre in the daytime, and this, too, by appointment. The material precautions thus left to be taken against fire in the London theatres are such only as individual managers think fit to adopt, and the unsatisfactory state of the dissension amongst divided and interested opinions is shown by the fact of Sir William Vernon Harcourt recently stating in the House of Commons that 'he would give the Metropolitan Board of Works all the support he could, if they required any further powers.' One hundred and eighty-seven theatres have been totally destroyed by fire between the years 1861 and 1877, and thirteen have been destroyed by fire yearly since. Strong as the following statements appear to be, they are intensified by their non-contradiction. 'The burning of the scenery alone of any theatre would be sufficient to suffocate the audience, and if the building cannot be cleared in three minutes it is a death-trap, for no instance of stopping fire that has once got a hold in a theatre is known.' The rapidity of the direful work is intimated at the late Alhambra, which was a sheet of flame from foundation to roof in twelve minutes from the first alarm. It may well be asked if the following authorities over our theatres—the Metropolitan Board of Works, the Lord Chamberlain, the divisional magistrates, the magistrates of Middlesex and Surrey, the City of London, and the Home Secretary—are prepared to declare every theatre in London safe for public use, and to back the responsibility of such an assurance by the official report of Captain Shaw? or are the British public to be informed after another serious loss of life, 'that it will form the subject of strict inquiry?' The facts are sufficiently eloquent to require no further comment.

AN IRISH VILLAGE.

THE Medical Officer of Health of the Carlingford Dispensary District, co. Louth, in his report upon the state of the village of Whitestown, which, for the past twelve months has, very naturally, not been free from fever, says:—'The village is about 300 yards in length, about 300 yards in breadth, and almost equally divided on each side of county road. The north or inland end is occupied by farmhouses, with their accompanying stables, cow-houses, piggeries, manure-pits, &c., all promiscuously, and interspersed by a few habitations of the poor in back courts. The south or shore end is mostly occupied by the poor, the majority of the poor living in two rows of cabins, regularly placed together, one on each side of the road. The houses on each side of the road are recessed from the road, a distance of from 7 ft. to 15 ft. This space between houses and the road, in almost all cases, is occupied by the piggeries, oat houses, or ass house, but in all cases by the manure heaps. The liquid manure from the farm offices and manure heaps of the north end flows down past the doors of these cabins often ankle deep in the centre of the road, though the earthen floors of the houses, as a rule, are on a lower level than the road. I visited over twenty of these health regenerating, and, as lately occurred, sometimes life-taking abodes of the poor, in each of which phoid fever raged, and it is my belief not one of them is fit for human habitation. They are on an average 10 ft. long by 12 ft. broad, up to 14 ft. by

16 ft., and contain only one apartment for sleeping and cooking. The front door (though I might not have called it front, as not one of them has a back door) is about 5 ft. high, the eave thatch about 6 ft. There are no back windows as well as doors. In a few there are openings about 1 ft. or 2 ft. square in the back wall. The greater number have no fireplaces or chimneys, the door or a hole in the roof giving exit to the smoke. Their roofs are low, the walls old, and in some cases half mud. These miserable hovels are inhabited by families varying in number from two to ten. I cannot think that the abodes I have described could be by any repairs made habitable. The only method, in my opinion, is that they be entirely taken down, and if the site on which they are at present be selected for new cottages, more frontage with rear accommodation be given to each, and that each be connected with a system of main sewerage running through the village from end to end, which would carry towards the seashore that surface liquid manure which is so dangerous to health and life.' It would be interesting to know to what landed proprietor this village has the privilege of belonging.

THE BIRMINGHAM PENNY DINNER SCHEME.

THE chairman of the committee (Mr. Osmund Airy), which was organised for trying the experiment of penny dinners in connection with the school children of Birmingham, has published a letter, dated February 26, in which he states that they have been engaged at two centres—Summer Lane and Gooch Street—in the endeavour to deal with the difficulties which presented themselves in connection with the question of providing penny dinners for the children attending the elementary schools of Birmingham. One point they have settled conclusively, viz., that, with a room rent free, an average attendance of 150 to 200 children, and an energetic committee, dinners can be provided and the cook's wages paid at a cost of one penny per head. But they have also found that the number who can pay a penny and are willing to do so was continually lessening, and that if a charge of one penny was made they failed to reach the cases where help was most imperatively needed. It had consequently become evident to the committee that the programme with which they started—that the operations were not to be charitable, but business-like—could not be maintained. Recognising that fact, and being unwilling to give up work which, even on the limited scale adopted hitherto, had done much good, the committee had recently been experimenting in the direction of free dinners. At the Summer Lane centre, in addition to children who paid their pennies, about eighty per day had been provided for out of a fund privately collected by a lady (Mrs. Sargent), who had devoted herself to carrying on the work at that centre. At the Gooch Street centre the plan had been tried of inviting the various parochial agencies to purchase tickets from the committee for distribution among necessitous cases coming within their own experience, and this plan had been attended with considerable success. In conclusion, Mr. Airy asks for subscriptions to a sufficient extent to justify them in carrying on the work at the existing centres for a time, and also to enable other centres to be formed, should the committee consider it advisable.

THE PUBLIC HEALTH

DURING FEBRUARY 1885.

THE mean temperature during the month of February at the Royal Observatory, Greenwich, was $43^{\circ}9$; it was as much as $5^{\circ}4$ above the average February temperature in one hundred years, and exceeded that recorded in the corresponding month of any year since 1872, when it was $44^{\circ}8$. An excess of temperature prevailed on twenty-three days of the month, while on the other five days it was below the average. The mildest day of the month was the 24th, when the mean was $50^{\circ}3$, and as much as $10^{\circ}5$ above the average; the coldest day was the 21st, when the mean was only $34^{\circ}1$, and $5^{\circ}4$ below the average. Rain was measured at Greenwich on nineteen days during the month, to the aggregate amount of 2.4 inches, which exceeded by nearly an inch the average February rainfall in sixty-one years. During the first two months of this year the rainfall amounted to 3.8 inches, which was nearly half an inch above the average for the corresponding period in sixty-one years. The sun was above the horizon during 277.9 hours during February, but only 37.8 hours of bright sunshine were recorded at Greenwich; this amount was considerably below the average of the second month in the five preceding years. South-westerly winds prevailed almost throughout the month.

In the twenty-eight large English towns dealt with by the Registrar-General in his weekly return, which have an estimated population of nearly nine millions of persons, 24,329 births and 14,452 deaths were registered during the four weeks ending the 28th ult. The annual birth-rate, which had been 36.4 per 1,000 in the preceding month, declined to 35.6 during February, but exceeded that recorded in the corresponding month of 1884. The lowest birth-rates in these twenty-eight towns last month were 27.3 in Bradford, 31.7 in Brighton, and 32.0 in Halifax; in the other towns the rates ranged upwards to 40.1 in Norwich, 40.3 in Nottingham, and 48.1 in Cardiff. In London the birth-rate last month was 35.0 per 1,000, while in the twenty-seven provincial towns it averaged 36.2.

The annual death-rate in the twenty-eight towns, which had increased from 20.5 to 24.4 per 1,000 in the four preceding months, declined to 21.2 during February, but exceeded by 0.7 per 1,000 that recorded in the corresponding period of 1884, which was 20.5 per 1,000. The lowest annual rate of mortality last month in these towns was 16.1 in Birkenhead. The rates in the other towns, ranged in order from the lowest, were as follow:—Brighton, 18.5; Bradford, 18.6; Portsmouth, 18.8; Derby, 19.1; Hull, 19.3; London, 19.7; Leeds, 19.7; Salford, 19.7; Halifax, 19.7; Huddersfield, 19.9; Sheffield, 20.2; Leicester, 20.5; Blackburn, 20.9; Wolverhampton, 20.9; Birmingham, 21.2; Nottingham, 21.7; Oldham, 22.4; Plymouth, 22.6; Bolton, 23.5; Bristol, 24.0; Liverpool, 24.6; Manchester, 25.6; Norwich, 26.3; Newcastle-upon-Tyne, 26.7; Cardiff, 30.4; Sunderland, 31.6; and the highest rate during the month, 32.4 in Preston. While the death-rate in London during February, as above stated, did not exceed 19.7 per 1,000, it averaged 22.4 in the twenty-seven provincial towns. The 14,452 deaths from all causes in the twenty-eight towns during the four weeks of February included 1,515 which were referred to the seven principal zymotic diseases, of which 446 resulted from whooping-cough, 338 from measles, 195 from scarlet fever, 144 from small-pox, 143 from 'fever' (principally enteric), 128 from diphtheria, and 121 from diarrhoea. These 1,515 deaths were equal to 10.6 per cent. of the total deaths, and to an annual rate of 2.22 per 1,000, which almost corresponded with the rates recorded in the two preceding months, and was below that returned in the corresponding period of 1884, when it was 2.46 per 1,000. The death-rate in London from the principal zymotic diseases was equal to 2.0 per 1,000 during February, and was 0.4 below the average rate in the twenty-seven provincial towns, among

which the zymotic death-rates ranged from 0.6 and Brighton and Derby, to 4.5 in Preston, 4.6 in Norwich, 7.1 in Cardiff, and 11.4 in Sunderland.

Whooping-cough was the most fatal zymotic in the twenty-eight towns during February. The mortality from this disease, which had risen from 0.66 per 1,000 in the four preceding months, was last month, and below the rate recorded in the corresponding period of last year. In London the death-rate from this disease was equal to 0.57, whereas in the seven provincial towns it averaged 0.65 per 1,000, and showed the highest proportional fatality in Birmingham, Norwich, Bristol, and Preston. The death-rate from measles, which had been 0.48 and 0.42 in the two preceding months, rose again to 0.50 during February. This disease was proportionally nearly twice as fatal in the provincial towns as in London, for while the measles rate in the metropolis last month did not exceed 0.1 per 1,000, it averaged 0.63 in the twenty-seven provincial towns, among which the highest rates were recorded in Huddersfield, Cardiff, and Sunderland. In the mentioned town the rate of mortality last month from measles was so high as 9.2 per 1,000. The death-rate from scarlet fever, which had been 0.45, 0.38, and 0.37 per 1,000 in the three preceding months, further declined during February to 0.29. This disease showed the highest proportional fatality in Leicester, Sunderland, and Preston. The rate of mortality from 'fever' (principally enteric or typhoid), which had steadily declined in the four preceding months from 0.41 to 0.21 per 1,000, was again 0.21 last month; in London the death-rate from this disease was only 0.14 per 1,000, while in the twenty-seven provincial towns it averaged 0.27, and was highest in Norwich. The mortality from diphtheria also showed a further decline from the recorded in recent months; this disease was proportionally most fatal in Newcastle-upon-Tyne, Plymouth, and Liverpool. During the four weeks of February 144 deaths from small-pox were registered in the twenty-eight towns, the fatality of this disease showed a decline in London while it showed a further increase in the twenty-seven provincial towns. Of the 144 deaths from small-pox during February, 125 were registered in London, 17 in Birmingham, 4 in Liverpool, 2 in Sheffield, 2 in Scotland, 1 in Brighton, 1 in Manchester, and 1 in Cardiff. Judged by the returns of the Metropolitan Asylum Hospitals, the prevalence of small-pox in London showed a slight decline during the latter part of February. The number of small-pox patients under treatment in the hospitals, which had risen from 536 to 1,147 at the end of the four previous months, declined to 1,103 at the end of February. The average weekly number of new patients admitted to these hospitals, which had steadily increased from 72 to 248 in the five preceding months, fell to 148 during February.

The rate of infant mortality in the twenty-eight towns measured by the proportion of deaths under one year of age to births registered, was equal to 132 per 1,000 in London during February, which was below that recorded in the corresponding period of either of the two preceding years, 1883 or 1884. In London the rate of infant mortality did not exceed 120 per 1,000, whereas in the twenty-seven provincial towns it averaged 142, and ranged from 86 in Brighton to 194 in Wolverhampton, to 196 in Cardiff, 198 in Scotland, and 203 in Preston.

The death-rate from diseases of the respiratory organs, judged by the metropolitan returns, was considerably below the average during February. The weekly number of deaths referred to these diseases in London averaged 383, and the annual death-rate was equal to 4.9 per 1,000. In Liverpool the annual rate of mortality from these diseases was last month equal to 5.9 per 1,000.

The causes of 328 of the 14,452 deaths registered in the twenty-eight towns during the four weeks of February were not certified, either by registered medical practitioners or by coroners. These uncertified deaths

equal to 2·3 per cent. of the total deaths, which showed a slight decline from the proportion in the preceding month. In London the proportion of uncertified deaths was only 1·3 per cent., while in the twenty-seven provincial towns it averaged 3·0 per cent.; all the causes of death were duly certified during the month in Plymouth and Leicester, while the proportions of uncertified deaths were largest in Sheffield, Halifax, Hull, and Oldham.

Among the population living in the outer ring of suburban districts around London, estimated at rather more than 1,000,000 persons, the annual death-rate from all causes during February was equal to 18·2 per 1,000, against 17·1 and 16·7 in the corresponding periods of 1883 and 1884. During the four weeks ending the 28th ult., 96 fatal cases of small-pox, 37 of diphtheria, 36 of whooping-cough, 22 of measles, 19 of 'fever,' 15 of diarrhoea, and 9 of scarlet fever, were recorded in the outer ring. These 234 deaths were equal to an annual rate of 2·7 per 1,000, which showed a further increase upon the rates recorded in recent months. The fatality of diphtheria and of 'fever' showed an increase, while that of measles and scarlet fever declined. Of the 96 deaths from small-pox recorded in the outer ring during February, 82 occurred in West Ham district (including 17 of London residents registered in the Metropolitan Asylum Hospital at Plaistow), 8 in the district of Edmonton, 2 in Croydon, 1 in Tottenham, 1 in Enfield, and 1 in Chislehurst sub-districts. Of the 37 fatal cases of diphtheria, no less than 17 occurred in the district of Edmonton; and the 19 deaths referred to 'fever' included 4 which were recorded in Tottenham sub-district.

NOTIFICATION OF INFECTIOUS DISEASES.

IN a table on page 412 are published uniform statistics relating to sickness and mortality in thirty-three of the thirty-nine urban sanitary districts of England and Scotland in which the notification of infectious diseases is compulsory. The estimated population of the thirty-three districts for which we are enabled to publish complete statistics for the month of February is rather more than three millions of persons. The annual rate of mortality from all causes per 1,000 persons estimated to be living in these towns, which had risen from 20·51 to 24·12 in the four preceding months, declined again during February to 21·03. In the twenty-eight large English towns dealt with by the Registrar-General in his weekly return, the death-rate during February averaged 21·20 per 1,000, and was, therefore, slightly above the mean rate in the thirty-three towns in the accompanying table. The rates of mortality last month were considerably below the average in Birkenhead, Burton-upon-Trent, Edinburgh, Heywood, Jarrow, Lancaster, and Warrington; while they showed an excess in Dundee, Greenock, Macclesfield, Preston, and Stalybridge. The death-rate from the eight infectious diseases dealt with in the table averaged 0·67 per 1,000 in the thirty-two towns furnishing this information, showing a further decline from the rates recorded in the four preceding months, which had steadily fallen from 0·98 to 0·70 per 1,000. No death from any of these infectious diseases was recorded in Heywood, Leek, or Warrington, and but one fatal case in Accrington and Reading; while they caused the highest rates of mortality in Barrow-in-Furness, Hartlepool, Halifax, Jarrow, Lancaster, Preston, and Rotherham. Small-pox caused 1 death in Barrow-in-Furness, 1 in Manchester, and 1 in Jarrow; scarlet fever was proportionally most fatal in Halifax, Leicester, Preston, and Stalybridge; diphtheria in Burton-on-Trent and Edinburgh; and enteric fever in Burnley, Blackburn, and Bolton. Two deaths from puerperal fever were returned in Dundee, and 2 in Halifax. With reference to the notified cases of infectious diseases in the thirty-two towns, it appears that the proportion of the population reported to be suffering from one or other

of the eight diseases was 4·66 per 1,000, against 6·71, 5·24, and 4·88 in the three preceding months. The proportion did not exceed 2 per 1,000 in Leek, Macclesfield, Oldham, and Warrington; in the other towns it ranged upwards to 6·04 in Birkenhead, 6·39 in Halifax, 7·68 in Rotherham, 8·52 in Leicester, 8·63 in Edinburgh, and 9·91 in Barrow-in-Furness. The high rates in the three last-mentioned towns were due to the excessive prevalence of scarlet fever. Four cases of small-pox were notified in Manchester, 3 in Birkenhead, 2 in Bolton, and 2 in Barrow-in-Furness, during the month under notice; scarlet fever was proportionally most prevalent in Barrow-in-Furness, Edinburgh, Halifax, Leicester, and Rotherham; diphtheria in Burton-upon-Trent and Edinburgh; enteric fever in Burnley, Lancaster, and Portsmouth; and typhus in Dundee and Greenock. Two cases of puerperal fever were notified in Salford during February, against 3 and 4 in the two preceding months.

SPECIAL REPORTS.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

T. O. DUDFIELD, M.D., President.

A MEETING of the Society of Medical Officers of Health was held on Feb. 20, 1885. The minutes of the last meeting were read.

The following gentleman was elected a member of the society:—Nominated by Dr. C. E. Saunders and Mr. Shirley Murphy—K. Bruce Lord, M.D. Edin., Medical Officer of Health to Helmsley, Yorkshire.

The following gentleman was elected an associate of the society:—Nominated by Dr. T. O. Dudfield and Mr. Shirley Murphy—W. R. Smith, M.D., of Bayshill Villa, Cheltenham.

Mr. William Weaver, C.E., Surveyor to the Vestry of Kensington, read a paper on 'SEWER VENTILATION AND HOUSE SANITATION,' of which the following is an abstract.

The author began with a description of the manner in which the present system of sewer ventilation and its attendant evils had arisen, and pointed out that the sewers were formerly ventilated by the drains entering them, all of which had untrapped outlets. The drains were brick barrels, those from the numerous street gullies generally being of large diameter and shooting direct into the sewers without any intervening trap; stoneware-pipe drains, with flap-trap outlets, next came into fashion, the increased duty of ventilation being thrown upon the untrapped gullies. In only a few cases has a drain-ventilator been carried up the front of the house, affording at the same time ventilation for the sewer. To alleviate the evils arising from the pressure on the sewer ventilators various efforts have been made. Patent charcoal ventilators have been fixed, a chamber has been formed in the ventilating shaft containing a frame from which was suspended numerous hanks of loose tow dipped in a solution of carbolic acid. Furnace shafts have also been suggested, and in some places the suggestion carried into effect. Mr. Weaver did not approve the adoption of lamp-post ventilation, and the provision of open grids has been attended with much complaint. After discussing the more recent method of disconnecting the house-drain from the sewer, and other points, the author laid down the following principles:—

1. That sewers and drains should be dealt with together as one system, the former depending upon the latter for ventilation, and the latter on the former for outlet. The open gratings in roads could then be abolished, except where left at intervals to serve as fresh-air inlets. The ventilating pipes should be kept as far as possible from windows and flues, and be governed by the same rules that apply to the latter when adjoining premises are increased in height. This proposed arrangement to apply to all new drains to be constructed after a certain date.

Table Showing Sickness and Mortality in Large Towns of England and Scotland During the Month of February 1885.

Towns.	Estimated Population Middle of 1885.	Small-pox.		Scarlet Fever.		Diphtheria.		Typhus Fever.		Enteric Fever.		Cholera.		Relapsing Fever.		Puerperal Fever.		Totals of Preceding Columns.		Annual Rate per 1,000 Persons Living.		Deaths from other Zymotic Diseases.				Total Mortality from all Causes per 1,000 Persons Living.
		Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Ill-defined Fever.	Measles.	Whooping-Cough.	Dysentery.	
Aberdeen	113,212	—	—	11	—	2	1	—	—	23	—	—	—	—	—	—	—	33	2	3.18	0.23	—	4	4	2	(?)
Accrington	35,000	—	—	2	—	5	—	—	—	5	—	—	—	—	—	—	—	35	5	9.91	1.30	1	1	4	3	17.88
Barrow-in-Furness ..	50,000	3	1	34	—	5	—	—	—	5	—	—	—	—	—	—	—	43	5	8.64	0.42	6	1	4	1	21.04
Birkenhead	93,000	—	—	23	—	..	..	..	..	14	4	..	..	..	..	..	..	34	9	4.01	0.71	—	—	1	5	13.05
Blackburn	110,500	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	21.23
Blackpool .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bolton	110,085	2	..	12	..	2	..	..	..	11	3	..	..	..	..	..	..	27	5	3.19	0.59	..	2	1	1	22.85
Bradford	214,431	43	3	4	3	4	3	..	..	10	2	..	..	..	..	..	..	57	8	3.47	0.49	2	2	14	3	18.54
Burnley	67,000	16	1	1	..	1	..	..	..	13	..	..	..	..	..	..	..	7	3	5.18	0.58	2	2	..	..	20.13
Burton-on-Trent ..	45,597	5	..	5	..	10	2	..	..	6	..	..	..	..	..	..	..	16	3	4.38	0.86	..	..	1	1	14.90
Bury	55,000	1	..	8	..	..	..	..	..	9	2	..	..	..	..	..	..	15	2	3.56	0.47	..	..	..	..	21.57
Chadderton	17,503	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Derby	87,608	16	..	20	..	6	..	..	..	6	1	..	..	..	..	..	..	23	3	4.02	0.45	..	..	..	..	19.49
Dundee	152,818	103	4	103	..	20	5	4	1	39	4	..	..	..	..	..	..	54	7	4.01	0.60	14	14	15	8	26.78
Edinburgh	250,615	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	106	14	8.03	0.73	2	2	19	..	16.64
Greenock	73,635	5	1	5	..	19	1	..	..	5	1	..	..	..	..	..	..	29	3	5.13	0.51	..	..	6	2	25.65
Halifax	77,500	32	7	32	..	1	..	..	..	4	1	..	..	..	..	..	..	38	11	6.39	1.05	..	..	..	..	21.36
Lancaster	20,978	3	1	3	..	..	..	..	..	3	1	..	..	..	..	..	..	4	2	2.05	1.45	..	..	4	1	23.90
Leek	13,421	12	..	12	..	..	..	..	..	8	1	..	..	..	..	..	..	4	2	2.09	0.00	..	..	..	..	16.16
Leicester	87,327	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	21	2	3.13	0.39	..	14	..	1	19.85
Liverpool	39,000	1	1	4	1	1	1	..	..	..	..	..	..	..	..	..	..	6	3	2.61	1.30	..	..	3	..	13.91
Llandudno	20,978	..	..	..	..	..	..	..	..	7	2	..	..	..	..	..	..	7	2	4.35	1.21	..	..	..	1	16.16
Manchester	341,508	4	1	57	7	5	2	..	..	22	4	..	..	..	..	..	..	91	13	3.47	0.69	..	9	17	7	21.36
Newcastle-on-Tyne ..	133,209	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	2	0.97	0.00	..	..	..	..	26.70
Norwich	91,215	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	89	8	8.52	0.77	..	..	6	3	20.32
Nottingham	211,444	19	2	11	6	..	..	..	..	9	1	..	..	..	..	..	..	39	9	2.40	0.55	2	1	12	5	26.30
Oldham	126,292	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	1.39	0.00	..	..	..	..	..
Parsmouth	131,059	25	1	11	1	..	..	..	..	3	3	..	..	..	..	..	..	16	5	1.65	0.52	..	..	9	1	22.59
Preston	100,406	28	0	..	..	..	..	..	..	10	5	..	..	..	..	..	..	52	5	5.05	0.49	..	3	..	..	18.52
Reading	46,070	8	..	8	..	4	1	..	..	7	..	..	..	..	..	..	..	11	4	4.7	1.41	..	..	17	2	32.72
Rotherham	35,052	18	3	18	..	..	..	..	..	..	..	..	..	..	..	..	..	14	1	3.69	0.38	..	..	..	..	16.91
Salford	804,060	49	..	49	..	8	..	..	..	12	..	..	..	..	..	..	..	64	10	2.68	1.10	..	1	1	1	21.21
Stafford	40,852	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4.09	0.61	..	..	16	..	19.63

2. That spaces or gaps should be left at regular intervals in lines or rows of buildings, in order to promote circulation of air and admit of the construction of sewer-ventilating flues.

3. That dust-bins should be abolished, and, in lieu thereof, each house should provide a galvanised iron or other approved receptacle for the dust and ashes; such receptacle to be left in a certain position on an appointed day in each week for regular removal by the local authority. No vegetable or other burnable refuse to be placed in the said receptacle under penalty.

4. That the Metropolitan Board of Works, district boards, and vestries should be urged to co-operate in order to obtain powers to the effect set forth in the three preceding propositions.

The President, after complimenting the author on the practical character of his paper, called attention to the powers possessed by the Metropolitan Board of Works to make by-laws for regulating the dimensions, form, and mode of construction, and the keeping, and cleansing, and repairing of the pipes, drains, and other means of communicating with sewers, and urged that there should be no interference with the house-drain unless with the consent of the local authority.

Mr. Robins recollected in 1853 making a suggestion to local authority for the ventilation of sewers through the house-drains. A design was made by a member of the Board for forming pillars in the roads something like pillar letter-boxes, but fitted with shelves, over which the air passed, coming out perfectly innocuous.

Mr. Turner thought much good had come of a proper method of flushing sewers. He did not think any reliance could be placed upon the use of charcoal, intercepting chambers, or tanks of tow and carbolic acid for preventing nuisance.

Dr. Butterfield was very doubtful whether surface ventilation of sewers should be increased or diminished; he considered that the water supplied for the carriage of sewage need not be 'filtered.'

Mr. Southam described the methods adopted in Clapton for ventilation of sewers, and stated that, where there was a dead end to a sewer, they had put ventilators against the houses and carried them up three feet above the roof.

Mr. Mineard spoke of the necessity for preventing articles of gravel and sand from entering the sewers; he thought that, where possible, sewers should be ventilated by pipes carried up houses.

Dr. Alfred Carpenter said that, whatever tended to oppose the flow of sewage downwards or the current of air upwards, was not a proper system. Sewers and drains were expensive on account of imperfect work. He approved a system of ventilating the sewers through the soil-pipes.

Mr. Armstrong was of opinion that sewer-air should not be permitted to enter house-drains. He thought it was a great waste to destroy organic matter by fire when it might be used for manure, and it was a waste to allow sewage to go into the sea.

Mr. Mark Judge thought that any proposal to take ventilating pipes from sewers through private houses could be opposed to the utmost.

Dr. Bate had examined 162 ventilators, and in 82 per cent. there was an up-current; in 49 cases the smell was insupportable. He objected to the ventilating pipe going into the house.

The Society then adjourned.

THE Home Secretary has appointed Mr. E. Pearce, one of the inspectors of the Local Government Board, to be an inspector under the Home Office, for the purpose of examining the provisions of Railway and Canal Improvement Bills before Parliament. He will also hold all inquiries as to the expediency of the provisions of such Bills as are unopposed, where the schemes involve the demolition of dwellings occupied by the artisan and working classes.

ARCHITECTURAL AND BUILDING TRADES EXHIBITION.

THIS Exhibition, held in the Floral Hall, Covent Garden, under the auspices of the Society of Architects, was opened on Monday, the 2nd inst. Amongst objects of special sanitary interest may be mentioned the stoves of Mr. Harry Hunt, Warming and Sanitary Engineer, Palace Stove Works, Newington Green, London, N. These stoves, to be seen at Stands Nos. 11A and 121, received Prize Medals at the International Health Exhibition in 1884, at the Smoke Abatement Exhibition in 1882, and at the Sanitary and Medical Exhibitions in 1881. The Hygiene Ventilating Hall Stoves are intended to be kept continuously burning, and require feeding every thirty-six hours with coke or other smokeless fuel. They are provided with mica doors, through which the fire may be seen. The mica is not liable to crack, and intercepts heat less than glass. The Crown Jewel American Gas-Burning Stove burns the Anthracite Smokeless Coal, is self-feeding, and is said to be very economical. The Argus and Victoria are stoves upon the Base Burner principle, and the Fairy is a smaller kind of American stove. All these stoves are provided with pipes for carrying off the products of combustion.

Stoves are exhibited at Stands Nos. 54 and 55 by Messrs. George Wright & Co., 155 Queen Victoria Street, E.C., and 238 Upper Thames Street, E.C. The 'Interchangeable Grate' offers facilities for regulating the rate of combustion. The back and part of the bottom are of fire-brick, the other part being fitted with a movable fire-brick bottom, or with an open grating, at pleasure. When the grating is used, the draught may be further increased by drawing out the ashpan. The 'Patent Bivalve' enables the smoke outlet to be regulated.

A Double Oven Kitchener, with registered self-acting cone ventilator, is exhibited at Stand No. 83 by Messrs. Steven Bros. & Co., 35 and 36 Upper Thames Street, E.C.

Stoves and Ranges are exhibited at Stand No. 86 by Messrs. Chambers, Monnery, & Co., 41 Bishopsgate Street Without, E.C.

At Stand No. 75, Mr. J. Grundy, 30 Duncan Terrace, City Road, N., exhibits his Patent Warm Air Ventilating Fire Grate, which affords a larger heating surface than an ordinary grate, the chimney for some distance being utilised as a hot-air chamber for supplying the apartment.

Amongst various household and other sanitary appliances, are the Self-Cleansing Latrines of Messrs. Bowes, Scott, & Read, Broadway Chambers, Westminster, S.W. The same firm exhibits a water-closet, as adopted by the London School Board, and a Patent Annular Syphon Flushing Chamber, at Stand No. 4. In this cistern the longer limb of the syphon dips about $\frac{1}{2}$ inch into water below the tank, which is kept at the proper level by a weir. When the water rises to the top of this longer limb, instead of running down the sides, it is guided by a lip and descends in the middle, thereby displacing a quantity of air, and gradually forming a vacuum in the discharging limb, so that the tank is rapidly emptied. By this arrangement a tank that may take a day or two in being filled by a small flow of water, is automatically emptied in a few minutes. These flushing chambers are adaptable to sewers where only a slight fall is attainable. The annular syphon can also be used for irrigation, the sewage being allowed to collect in tanks and discharged at stated periods on to the land by means of carriers. Super-saturation is thus avoided, as the land is enabled to take up one lot of sewage before another is discharged upon it.

At Stand No. 5, Messrs. J. Sessions & Sons, Gloucester, exhibit enamelled slate urinal compartments, some with earthen urinals, and some without the latter, having the lower part of the slate back set sloping and enamelled of a dark colour. Also a housemaid's sink and lavatory, with lift-up lid and separate receiver for slops, and an 'Unitas' water-closet and fittings, with flushing cistern and lift-up seat, so as to serve as slop receiver and urinal.

This water-closet is without the usual wood casing and apparatus. (See SANITARY RECORD, Jan. 15, p. 305.)

At Stand No. 6, Messrs. Ewart & Son, 346 Euston Road, N.W., exhibit the 'Challenger' bath, in iron, tinned and japanned, with fittings complete, no wood casing being necessary. Water-heaters are provided, to burn gas, by which boiling water can be readily obtained. This firm also exhibits the 'Empress' copper revolving ventilators; smoke curers, revolving and stationary; and Tobin tubes, with V-shaped canvas purifiers for cleansing the air.

At Stands Nos. 7 and 8, Messrs. George Farmiloe & Sons, 34 St. John Street, E.C., exhibit their Elastic Valve Closets, in which the supply can be regulated by means of a tap. Also the 'Eos' Closet, with trap in one piece, and above the floor line; and the Patent Waste Preventing Cistern, which gives the full contents without the handle being held. The same firm exhibits the 'Gibson' Pump, with a vacuum chamber arranged to secure easy working with an equal flow; the Bennor Lever Gas and Back Water Trap, in which an India-rubber ball closes the mouth of a pipe when empty, or is floated up by the water when it rushes in; and several closets, urinals, &c.

At Stand No. 9, Mr. C. G. Roberts, Haslemere, Surrey, exhibits the Patent Automatic Rain-water Separator, which took a Silver Medal at the International Health Exhibition. The separator is made of zinc upon an iron frame. It is self-acting, and directs into a waste-pipe or foul-water tank the first portion of the rainfall that washes off and brings down from the roofs soot and other impurities. After the rain has been falling for a certain time, which can be regulated, the separator cants and turns the remainder of the water into the storage tank.

At Stand No. 10, Messrs. Shanks & Co., 46 Cannon Street, E.C., exhibit iron baths with porcelain enamel, and the Tubal Closet, without wood casings; also waste preventers bearing the stamp of the New River Company, to which a Gold Medal was awarded at the Health Exhibition.

At Stand No. 11, Mr. Milton Syer has the Patent Pneumatic Valve and Syphon Cistern, to supersede the ordinary water-closet apparatus. By pressing and releasing a small 'push' button, a supply of water is obtained, which is stopped by an automatic valve. These 'push' buttons can be fixed under a pedal in front of an urinal, or under the self-action water-closet seat, so that the water may flow after use.

At Stands Nos. 14 and 15, Messrs. Banner Bros., 11 Billiter Square, E.C., show models and drawings of their system of drainage, to which a Gold Medal was awarded at the Health Exhibition; also Patent Exhaust Ventilators (veering or fixed); Traps for Drains, in stone-ware and rustless iron; and Manhole Iron Covers, with imperishable air-tight joint made with sand. These three preceding specialties gained Silver Medals at the Health Exhibition. The Banner Water-closet is also exhibited here. It is formed in parts, to be used as urinal, slop-receiver, or water-closet.

At Stand No. 17, Messrs. Robert Boyle & Son, 64 Holborn Viaduct, exhibit their well-known ventilating appliances, with plans illustrating their system of ventilation, as applied to ships, workmen's houses, ordinary dwelling-houses, and prisons. Messrs. F. Braby & Co., 356 to 362 Euston Road, N.W., also exhibit ventilators, besides other sanitary appliances, at Stand No. 18.

At Stand No. 20, Messrs. Hayward Bros. & Eckstein, Union Street, Borough, E., exhibit their Sheringham Ventilator, to be regulated by means of a cord; their improved Mica Outlet, for the discharge of vitiated air from rooms into a smoke-flue; and their Fresh Air Mica Inlet Valves, in galvanized iron, for ventilating drains. The valves are formed with hinged flaps of mica. In the Silk-flap Ventilator, for prevention of down-draught in air-extraction shafts, the valves are formed with oiled silk, and operate without noise. The same firm exhibits the Air-tight Inspection Cover, for drains.

At Stands Nos. 22 and 23, Messrs. C. Kite & Co.,

Christopher Works, Chalton Street, N.W., exhibit Wall Inlet Ventilators. They are hinged at the bottom, have net screens inside for cleansing the air, and can be closed flat against the wall. They can be concealed by means of mirrors, pictures, or small hanging cabinets. The same firm exhibit a Silent Automatic Outlet Chimney-breast Ventilator, to be fitted into smoke-flues near the ceiling. It protrudes inside the flue to the extent of 2 inches. There are also the Roof Outlet Ventilators, for fixing upon roofs, with hinged valves regulated by cords; the ornamental Turret Ventilators; and the Registered Drain Ventilators, with induced current outlets and down-cast inlets. This firm also exhibits a model house, illustrating the application of Kite's Ventilators to ordinary dwellings. They have gained the Gold Medal (highest award) for Induced-current Ventilators, and the Silver Medal for Drain Ventilators, at the Health Exhibition.

At Stand No. 24, Messrs. J. M. Lamb & Co., 119 Finchley Road, N.W., show their Prize Medal Air-propelling Fans, and Air-warming Apparatus, for connection with vertical air-tubes, for the supply of warm fresh air. It can also be used as a stove, or for cold air supply in summer time. The same firm exhibit various ventilators, chimney cowls, and other appliances.

At Stand No. 51, Messrs. Broad & Co., 2 and 4 South Wharf, Paddington, W., exhibit various sanitary specialties, which have secured a Silver Medal at the Health Exhibition; amongst which may be mentioned the Reducing Syphon and Channel Pipe, for increasing the velocity of sewage by a gradual diminution of the diameter of the drain; and the Air Inlet, for use where air is admitted to a drain from the ground level. It has a cast-iron ventilating cover with a hanging receptacle below, to receive any solid matter that would otherwise fall into the drain. The white-enamelled channel drain-pipes of this firm deserve special notice. There are also several white-enamelled cisterns, sinks, and other appliances, which have received the Silver Medal award.

At Stand No. 67, Messrs. Quirk, Barton, & Co., 61 Gracechurch Street, E.C., exhibit their Patent Tin-lined Lead Piping and Sheet Lead, for security against lead-poisoning in water, beer, and other liquids. The piping is said to cost about double the price of ordinary lead-piping; but, as the strength of the tin lining enables about half the weight of metal per foot run to be used, the actual difference of cost is very trifling. The same firm exhibit Laminated Lead, for damp-proof courses, and for lining damp walls. The cost of this is about 17s. per cwt., one cwt. being sufficient to cover an area of 400 superficial feet. Wall-paper can be pasted over it if desired. This firm have been awarded the Gold and Silver Medals at the Health Exhibition, and the Awards of Merit at the International Medical and Sanitary Exhibitions in 1881.

At Stand No. 69, Messrs. James Stiff & Sons, London Pottery, Lambeth, exhibit their Weatherley Traps, Ventilating Damp-proof Courses, and other specialties.

Mr. C. D. Phillips, Embyn Works, Newport, Mon., exhibits, at Stand No. 72, his Patent Lockjaw Roofing Tiles. They interlock on both sides, top and bottom, with a groove and tenon joint, and only require the same timber as slates. They are manufactured under great pressure, in order to be non-porous and exclude all damp.

At Stand No. 74, Messrs. E. Aldous & Son, 2 Elmhurst, Upton Lane, Upton, E., exhibit Roof Exhaust Ventilators, Ceiling Ventilators, for single rooms, House Ventilators, for ventilating several rooms upon the Trunk system, by means of one exhaust; and several other appliances.

At Stand No. 78, Mr. J. A. Somerset, St. Nicholas Iron Works, Newcastle-upon-Tyne, exhibits his 'Upson' Wall Ventilator, and 'Draughtless' Window Ventilator and Air Warmer. In the former, fresh air is introduced at the rate of 4,500 cubic feet per hour, and is warmed by passing over a number of thin copper plates heated by means of gas-burners. The fumes of the gas are condensed in tubes and chambers. It is calculated that the air thus warmed is increased 30° in temperature. The

'sightless' Window Ventilator has a double-glazed top. The air is admitted between the glazing, being warmed by contact with a row of gas jets. An extractor over the products of combustion.

At Stand No. 80, Moule's Patent Earth Closet Company (limited), 5A Garrick Street, W.C., exhibit several specimens of their well-known earth closets, some of which have self-action seats.

At Stand No. 81, Mr. W. White, Great Western Works, Weymouth, exhibits his patent 'Hygeian Rock' Building Composition. It is adapted for damp-proof courses in walls, and, as a preservative against damp, for coating the inside of walls, or filling in between double thicknesses of lining.

At Stand No. 82, Mr. J. B. Papier, 34 Church Road, Brighton, N., exhibits Patent Exhaust Ventilators, for dwelling-houses, public buildings, drains, soil-pipes, &c. reversing it, it can be used as a fresh air injector. A patent Fresh Air Wall Filter, to be fixed at from 5 to 6 feet from the floor, is also exhibited.

At Stands Nos. 84 and 85, Messrs. T. Bradford & Co., 143 High Holborn, W.C., exhibit a model of their patent Disinfecting Apparatus, portable or fixed, for disinfecting linen. It consists of a wrought-iron base, divided into three compartments, the central being the drying chamber, and the two side chambers being for filtration, which is regulated through them, into the fire chamber, by a series of horizontal and vertical slide-valves. The linen is placed above upon galvanised iron frames, and dried with a lifting box during fumigation.

At Stand No. 96, Mr. R. Lowe, Britannia Works, Bolton, near Bolton, exhibits various samples of wood-block flooring. The wood blocks, after being carefully selected, are laid upon a hard dry surface of concrete, and fastened by means of Lowe's Patent Composition, which is said to prevent dry rot and dampness.

At Stand No. 100, the North of England School Fitting Company (Limited), 121 Newgate Street, E.C., exhibit, amongst other fittings, Glendenning's patent Adjustable Desk, with Dr. Roth's Hygienic air. The desk and seat admit of instant adjustment, the desk having a further sliding horizontal movement, to prevent the necessity of stooping at study.

At Stand No. 102, Messrs. Tunstall & Co., St. Paul's Chambers, Leeds, exhibit specimens of their Roofing Cloth, 3 feet wide, and 14 ft. per square foot. This is a waterproof material, and may be fastened upon roofs by means of a solution, thus dispensing with nail holes. It is adapted for internally covering damp walls, and may be lined or papered. It can also be used for damp-proof courses.

At Stands Nos. 108 and 109, Morell's Sanitary Appliance Company, 4 St. Anne's Square, Manchester, exhibit models of their Patent House Ashes and Earth Closet Apparatus. The sifted cinders are delivered at the foot of the collection for re-burning, and on each use of the seat, which is provided with a self-action seat, a dose of dust is delivered near the soil, which arrests decomposition. Dried earth may be added. This invention has won a Gold Medal at the Health Exhibition. Other apparatus are exhibited here, including a patent receptacle for cleansing liquid refuse, and a portable closet for chamber use.

The use of non-poisonous materials in decoration is displayed in several designs exhibited at Stands Nos. 37 and 38, where Messrs. W. Woollams & Co., 110 High Street, Finsbury, display some specimens of non-arsenical wall papers, some of which have been designed by eminent artists.

At Stands Nos. 39 and 40, Messrs. Jeffrey & Co., 64 Essex Road, N., also exhibit several hand-painted and printed wall papers, entirely free from arsenic.

At Stand No. 76, Messrs. F. Walton & Co. display specimens of their well-known 'Lincrusta-Walton' decorative material, which is non-absorbent, and can be washed. It has been awarded thirteen Prize Medals,

amongst which is the Gold Medal of the Health Exhibition.

At Stand No. 43, Messrs. H. Thompson & Co. show specimens of their non-poisonous and damp-proof oxide of iron paints, which can be painted or papered over if desired.

Messrs. Verity Brothers, of Call Lane, Leeds, and High Holborn, London, at Stands Nos. 26 and 27, made a similar display of their specialities in 'window gearing' (which are of a meritorious character) to those mentioned in the report of the Leeds Exhibition in the February number of the SANITARY RECORD. They also exhibited Crabtree's Patent Kitchen Range, for which they are the sole London agents. This range was exhibited last year at the Health Exhibition at South Kensington, where it was awarded a Gold Medal, and was described by us in the SANITARY RECORD report of the Exhibition published at the time.

CHEMICAL FACTS CONNECTED WITH PLUMBING.

THE interesting lecture, of which the following is an authentic abstract, was recently delivered to the members of the Dundee Society of Architects by Professor Carnelley, of University College, Dundee.

The object of the paper was to give a brief *résumé* of our present knowledge of the action of water on the metals most commonly used in plumbing. For it is considered to be highly important from a sanitary point of view that plumbers and others interested should have a general knowledge of this subject. The present paper was limited in the main to a discussion of the corrosive action of various kinds of water on lead, copper, and zinc.

Copper.—As copper exerts a very poisonous action on the human system, it is important to know what solvent action different waters have on this metal, especially as copper is frequently used in the construction of vessels for culinary purposes and of cisterns for storing water. That most waters do take up a perceptible quantity of this metal was proved by the statement of several cases in which very injurious effects were known to have resulted from the use of copper for culinary purposes and for the storage and conveyance of water. This fact was further proved by numerous experiments which had been made by the essayist some years ago, some of which were shown at the meeting last evening. Even perfectly pure water has a distinct action on copper, although it may only have been in contact with the metal for a single hour, and this action is considerably increased when the water contains mineral matters dissolved in it, more especially chlorides (as common salt) and ammonia compounds. Water contaminated with sewage, and therefore, as a rule, containing comparatively large quantities of ammoniacal salts and chlorides in solution, is especially objectionable, not only on account of its actual composition, but also because, where copper pipes, vessels, &c., are used, its action on the metal is much increased by the presence of these substances in the water; for the same reason it was shown that such water is less suitable for use in generating steam, where brass taps and machinery fittings are exposed to its action, or to that of the steam from it. The corrosive action of sea-water on copper and metals containing copper is due to the dissolved salt.

Lead.—The surface of a piece of lead, when freshly cut, presents a high metallic lustre, but it soon tarnishes on exposure to the air, owing to the formation of a thin film of oxide, which to a great extent protects it from further change. Lead undergoes no alteration in perfectly dry air, or in water free from air, but is subject to a powerful corrosion under the combined influence of air and water; this applies more or less to all metals which are corroded by water. Thus, when ships' sheeting is corroded, the water line is the part which suffers most. The rapid corrosion of lead cisterns which sometimes takes place is due

to their being repeatedly emptied and refilled from a jet with a heavy fall of water. Cisterns should always be arranged so that the water is maintained at a constant height; whilst leaden covers should never be used, especially for hot-water cisterns, for the aqueous vapour condenses thereon, and, together with the combined action of the air, rapidly attacks the lead, and on dropping back into the cistern carries with it considerable quantities of lead. Hot water especially has a marked action on lead, and particularly when distilled through leaden pipes. The use of water drawn from a hot-water cistern should therefore always be avoided for drinking and culinary purposes. The action of water on lead is greatly influenced by the nature of the dissolved impurities, even when the latter amounts to no more than 3 or 4 grains per gallon. The purer kinds of water, such as rain-water, are generally very corrosive, this corrosive action being still further increased by the presence of nitrates, nitrites, and ammoniacal salts. The corrosive action, however, is very greatly diminished by the presence of sulphates, phosphates, carbonates, and especially carbonate of lime held in solution by carbonic acid. The reason, in fact, why so few natural waters act on lead to any dangerous extent is due to their almost always containing more or less of this compound in solution, which causes a thin film of an insoluble basic carbonate of lead to be formed on the surface of the metal, which is thus in most cases protected from the further action of the water. The action of aerated waters on lead was also referred to. Cisterns should always be soldered autogeneously, for by the use of a solder containing metals different from that composing the cistern the corrosive action is considerably increased, owing to a galvanic action being set up. For this reason, composition lead-piping, consisting of an alloy of lead and antimony, should never be used for water connections, being fraught with considerable danger to the health of those using the water for drinking or cooking. Attention was also drawn to certain defects in tin-lined lead-pipes, which are so largely used in beer-shops for connecting the beer cask with the pumps on the counter. Though the action of water on lead has in many cases been considerably exaggerated, yet it is nevertheless important that all risk of corrosive action (which under certain conditions may be very considerable and highly dangerous) should be as far as possible avoided.

Zinc.—It has long been known that zinc dissolves in water at ordinary temperatures. Distilled water and rain-water corrode zinc more readily than hard waters, especially those which are rich in carbonate of lime. Indeed, the action of the latter is but slight, since the zinc soon becomes coated with an insoluble layer of a hydro-carbonate of zinc, which protects it in great measure from further action; but still a portion of the hydrate of zinc remains suspended, rendering the water opalescent, whilst a smaller quantity is dissolved. Thus all kinds of vessels in domestic use, whether made of zinc or galvanised iron, impart to water a certain quantity of zinc. Now, though both copper and lead are highly poisonous, there seems to be some difference of opinion as regards the action of zinc on the human system. Some authorities believe that it is not injurious, except when taken in doses much larger than are ever likely to occur in drinking water, and that it is not cumulative. Other authorities, however, have attributed very grave effects to the use of water stored in zinc or galvanised iron vessels. A French Government Commission, which inquired into this subject, decided that the use of such water was injurious to health; and it is stated that, in the construction of water-tanks for the French Navy, zinc is especially avoided.

Engineers should bear in mind this corrosive action of water, and particularly rain-water, on zinc and galvanised iron, which is used so largely in connection with roofing and for carrying off rain-water. From a careful consideration of the whole subject, Professor Carnelley believes that for cold, and for all but very soft water, lead is the best metal for use in the storage and conveyance of water;

whilst for hot, and for very soft water, copper (or, better, well-tinned copper) is attended with least risk to health.

SANITARY MATTERS IN AMERICA.

(FROM OUR OWN CORRESPONDENT.)

NATIONAL BOARD OF HEALTH.

IN my last communication, printed in your January issue, I gave a brief synopsis of a Bill to provide a National Board of Health, which had been prepared by representatives from the various state and city boards of health throughout the country. This Bill was introduced into the House of Representatives, and, for a time, seemed really to be the solution of the whole vexing question. Even Dr. J. B. Hamilton, surgeon-general of the United States Marine Hospital Service, assured friends of the Bill that he would give it his hearty support. His friendship for the Bill was supposed to be a great aid, for it has been by his open antagonism and charges of incompetency that the old National Board of Health has been so badly worsted in its fight for re-instatement. The Bill, however, will die in the hands of the Committee on Public Health, which reported to the house that, owing to the lateness of the session, it would be impossible to secure any new legislation, and recommended that an appropriation of 25,000 dollars be made for the old National Board of Health, and 500,000 dollars to be set aside as an epidemic fund, to be used at the discretion of the President. These items will probably be attached to the Sundry Civil Service Bill, which will come up next week, and may be stricken out. In the Senate, a Bill prepared by Dr. O. W. Wight, Health Officer of Detroit, Michigan, has been presented by Senator Palmer. In many respects the Palmer Bill is superior to any other. It provides for a commissioner of health, who shall be an attaché to the Treasury Department, and who shall have plenty of assistants in the shape of inspectors of ventilation, plumbing, &c. This Bill is fully in line with Dr. Wight's personal views, as he advocates 'one-man power' with no division of responsibility. As the Palmer Bill is the only one which has recognised the plumbers as an auxiliary sanitary class, it has called out a card from Mr. Andrew Young, President of the National Association of Master Plumbers, who commends the Bill, and asks all the local associations to pass resolutions urging the passage of the Bill. But I confidently expect that, before these lines will have been published, Congress will have adjourned without granting any sanitary recognition. It may create an epidemic fund of 500,000 dollars, but as it cannot be used to prevent the introduction of cholera or yellow fever, but only to prevent its spread after its appearance, it will be seen that it will be a one-legged provision.

NATIONAL ASSOCIATION OF MASTER PLUMBERS.

Speaking of the National Association of Master Plumbers reminds me that the titles for the essays to be presented at the third annual convention in St. Louis, in June next, have been assigned. The essays will treat on 'Trade Interests'; 'Should the Architect direct the Plumber?'; 'Is the Plumbing Work the Most Essential Part of the Building?'; 'The Qualifications for Conducting the Plumbing Business'; 'The Proper Education of the Craft'; 'International Associations'; 'Is Lead Detrimental to Health as a Conduit for Water?'; 'How to Promote the Unity of Associations'; 'National Legislation for Sanitary Advancement'; 'Apprenticeship and Trade Schools'; 'The Manufacturer and the Plumber—Are their Interests Mutual?'; 'Is Arbitration between the Employer and Employé conducive to Mutual Benefit?'; 'The Householder *versus* the Plumber'; 'What are the Relative Advantages of Imported and Domestic Plumber Material?'; 'Practical Plumbers as Sanitary Experts'; 'To what extent has the Plumber contributed to the Invention of Sanitary Appliances?'; 'The Waste of Water

and How to Prevent It; 'The Plumber of Should Sanitary Legislation be Initiated by the Profession?' 'The Proper Ventilation of House' 'What Can the Plumber Do to Prevent Cholera?' Some of these subjects have an international character and I would respectfully suggest to Mr. Buchanan, Mr. J. F. Clarke, and other leaders in the ranks in Great Britain that they prepare some and send them to the secretary to be read at the convention. He may be addressed at 537 W. Street, Chicago.

DISPOSAL OF SEWAGE IN CHICAGO.

Of the most important sanitary engineering reports issued in this country has just been made public. It is the report of Mr. Gray, city engineer of Providence, Rhode Island, upon the disposal of the sewage for that city and its town. The City Council sent Mr. Gray abroad, with his assistant, to study the Pail, Liernur, Berliet, Combined, and Separate systems, as they are used in different cities. His summary of the action of these systems is very valuable as a record for reference. His recommendations for sewage disposal in Providence, Rhode Island, attract the greater interest. He recommends receiving trunk sewers be constructed which shall carry the sewage to Field's Point at the mouth of the Pawtuxet River, and that it be there treated by chemical means so as to precipitate the solids and clarify the water, which would then be turned into deep water at sea. As this proposed scheme, if it shall be adopted, is the first instance of chemical treatment of sewage on a large scale practised in this country, it possesses more than ordinary interest. Colonel George E. Waring has reviewed the report in the columns of the *American Engineer*, of Boston, and has criticised Mr. Gray's recommendations and deductions. The estimated cost of carrying out Mr. Gray's recommendations is 3,699,504 dollars. The following method of disposing of sewage, the convulsions, &c., was made public by Dr. C. H. von Dreyer of Dayton, Ohio, at the sanitary convention at Columbus, Ohio. To a vault containing 40 barrels of fecal matter add one barrel of common salt; in 24 hours add 15 lbs of unslacked lime; chlorinated lime will then be added.

After eight days it is entirely dissolved and ready. Then add 75 pounds of sal soda. In ten days the sewage will be solidified and ready to form bricks, which, after drying thirty days in the air, are used as fuel, costing about one-half as much as coal, comparing heat units evolved.

The Master Plumbers' Association of Chicago has established a public circulating sanitary library, the only one of its kind in the world.

Sanitary protective leagues have recently been formed in New York and Brooklyn among the prominent business men, and one is being agitated in St. Louis.

A successful sanitary convention was held at Columbus, Ohio, in February, and one is to be held at Lansing, Michigan, on March 19 and 20. These public meetings do much to increase sanitary knowledge among the lay public.

HEALTH OF IRELAND.

The quarterly return of marriages, births, and deaths in Ireland recently issued by the Registrar-General of that country contains statistics relating to marriages for the quarter of 1884, and to births and deaths for the last three months of that year. The marriages, births, and deaths exceeded their respective averages in the corresponding quarters of recent years. The returns of marriages for the last quarter of 1884, as compared with the corresponding period of 1883, show a decrease in the number of indoor and of outdoor paupers; and a decrease in the number of persons in receipt of outdoor relief, how-

ever, considerably exceeded the average for the last quarter of the ten preceding years.

The births registered during the three months ending December last were 28,436, equal to an annual rate of 22.9 per 1,000 of the population in the middle of last year, estimated at 4,962,570. This rate was 0.9 below the average rate in the corresponding period of the five years 1879-83. In the four provinces of Ireland the birth-rates were 20.9 in Munster, 22.2 in Ulster, 22.4 in Connaught, and 22.5 in Leinster.

During the last quarter of 1884 the deaths registered in Ireland were 21,299, equal to an annual rate of 17.2 per 1,000 of the estimated population, which slightly exceeded the average rate in the corresponding period of the five years 1879-83. The meteorological conditions of the quarter were, on the whole, favourable to the public health. In Connaught the general death-rate last quarter was 12.2 per 1,000, in Ulster 15.5, in Munster 16.6, and in Leinster 20.5.

The 21,299 deaths registered in Ireland in the quarter under notice included 438 which were referred to scarlet fever, 424 to 'fever' (principally enteric), 366 to diarrhoea, 317 to whooping-cough, 118 to diphtheria, 74 to measles, and not one to small-pox. Thus, 1,737 deaths resulted from these principal zymotic diseases, equal to 8.2 per cent. of the total deaths and to an annual rate of 1.4 per 1,000, against 2.2 in England and Wales from these diseases during the same period. In the aggregate, the deaths from the principal zymotic diseases in Ireland during the last three months of 1884 were below those recorded in the corresponding period of the preceding year. Compared with the third quarter of 1884, the deaths referred to scarlet fever, diphtheria, and to different forms of 'fever,' showed a considerable excess. Scarlet fever was proportionately most fatal in Waterford, Fermoy, and Belfast; whooping-cough in Queenstown and Lurgan; fever in Limerick and Belfast; and measles in Armagh. No death from small-pox was registered in Ireland during the last six months of 1884.

The return, as usual, contains an important and interesting table relating to the mortality in urban and rural sanitary districts. In the forty-eight urban sanitary districts (including Dublin), comprising a population of rather more than a million persons, the death-rate from all causes during the quarter under notice was 27.3 per 1,000, and the zymotic rate 3.2; in the rural sanitary districts, comprising a population of somewhat exceeding four millions, the rate of mortality did not exceed 13.7, and the zymotic rate was only 0.9 per 1,000. In Dublin, consisting of nine urban districts, and having a population estimated at nearly 350,000 persons, the death-rate from all causes was 29.4 per 1,000, and the zymotic rate 3.7. In London these rates were respectively 20.1 and 2.1, and in Edinburgh 19.6 and 2.6 per 1,000.

The number of emigrants who left Irish seaports during the last quarter of 1884 was 9,343, being 1,247 less than the number in the corresponding quarter of 1883, but slightly exceeding the average number in the four quarters of the ten years 1874-83. According to the Board of Trade Returns, the number of emigrants of Irish origin who left the various ports of the United Kingdom at which emigration officers are stationed, which had been 1,667 and 1,950 in the last quarters of 1882 and 1883, declined to 1,800 during the three months ending 31st December last.

THE 'SANITAS' COMPANY (LIMITED).

THE eighth ordinary general meeting of the shareholders of this company was held at the offices, Letchford's Buildings, Three Colt Lane, Bethnal Green, on Tuesday, Feb. 17, for receiving the directors' report and accounts for the year ending Dec. 31, 1884. It was largely attended; F. H. L. R. Moll, Esq., occupied the chair.

The report, which was taken as read, stated that the sales amounted during the year to 19,267. 1s. 11d. After

providing for bad and doubtful debts, the balance to credit of revenue, with the amount brought forward the previous year (90*l.* 18*s.* 9*d.*), amounted to 5,201*l.* 10*s.* 4*d.* From this sum 215*l.* 8*s.* 4*d.* had been paid during the year for interest on debentures and 1,266*l.* 13*s.* 4*d.* on account of interim dividend for the half-year ending June 30, 1884, leaving a balance of 2,877*l.* 14*s.* 7*d.* The directors recommended that a final dividend of 7½ per cent., free of income tax, be declared, making, with the interim dividend already paid, a total distribution for the year of 12½ per cent. This would absorb 2,302*l.* 10*s.*, and leave a balance of 575*l.* 4*s.* 7*d.* to be carried forward. The report further stated that during the past year the debenture debt of the company had been paid off, the capital required having been raised by the issue of shares at a satisfactory premium. Acting upon the recommendation of some of the largest shareholders the company had completed the purchase of the remaining two-fifths of all the foreign patents and trade marks for 'Sanitas' products. Under the recent convention entered into between Great Britain and certain other countries, the company are now taking steps to develop a trade in 'Sanitas' products on the Continent and elsewhere, and already a favourable arrangement has been entered into for the sale of 'Sanitas' in Belgium. In accordance with the articles of association, Messrs. F. H. L. R. Moll and M. Zingler, two of the directors, retired, but offered themselves for re-election, and the same course was adopted by the auditors, Messrs. W. Williams & Co. In advocating the adoption of the report, the chairman adverted to its main points. He remarked on the advantageous results to the company of the purchase of the remaining interest in the foreign patents; also that their plant had been considerably increased, and that, owing to this fact and the improved position of the company, they would be enabled to make important alterations to the benefit of the public in some of their leading productions. Thus it was their intention, so soon as the necessary arrangements could be made, to discontinue the manufacture of the lower quality of 'Sanitas' fluid, and to sell only the best quality at the price now paid for the second quality of fluid. He also called attention to the satisfactory progress they were making with the sale of their products upon the Continent, and that it was intended to grant licences for the manufacture or appoint agents for the sale of 'Sanitas' products abroad.

Mr. C. T. Kingzett, the managing director and chemist of the company, and to whose indefatigable exertions the success of the company is mainly due, said that they had registered the word 'Sanitas' all over the civilised world, which would prove a great security to themselves and their agents, and all their licensees. The report was adopted unanimously, the directors were re-elected, and a grateful vote of thanks accorded them.

THE METROPOLITAN PUBLIC GARDEN, BOULEVARD, AND PLAYGROUND ASSOCIATION.

The usual monthly meeting was held on March 3, at 83 Lancaster Gate, Lord Dorchester in the chair. The Council took into consideration upwards of fifty separate matters. The Secretary announced that Northampton and Wilmington Squares would be opened on the 4th inst., that the Lambeth Vestry had accepted the offer of 100*l.* towards tree-planting in Kennington Road, that the laying-out of the burial-ground of St. Bartholomew's, Bethnal Green, and Carlton Square, E., were being proceeded with, and that the Secretary for the War Department had declined to allow the Tower Garden to be thrown open. It was agreed to lay out the ground surrounding St. Paul's, Rotherhithe, to offer six seats for the garden in Horseferry Road, to ask the Kensington Vestry to erect seats in Brompton Road, and to approach the owners of Ravenscourt Park, and the disused burial-grounds of Christ

Church, Newgate Street, Christ Church, Spitalfields, Christ Church, Blackfriars Road, St. Martin, Vintry, St. John, South Hackney, and Guy's Hospital, with a view to their being opened to the public. Sums of money were voted towards the improvement of Wilmington Square and the western garden of Canonbury Square, and a grant of 10*l.* was made towards the formation of a gymnasium near Finsbury Circus.

On the 4th inst., owing to the generosity of the landlord, the Marquis of Northampton, the Metropolitan Public Garden, Boulevard, and Playground Association threw open to the public the gardens of Northampton Square, and Wilmington Square, Clerkenwell. The success of the opening of Canonbury and Ebury Squares has fully warranted this new undertaking, and the members of the Association are confident that the grounds will prove far greater boons in the neighbourhood than they have done hitherto. With such excellent examples as the Duke of Westminster and the Marquis of Northampton before them, it is to be hoped that other landowners will step forward and offer their enclosures to the Society, so that these may be converted into open gardens.

At the desire of the vicar, the Rev. H. G. Sprigg, the Association has improved and thrown open the ground attached to Christ Church, Battersea. This will be a welcome and peaceful resting-place in the midst of the bustling thoroughfare.

NEW INVENTIONS.

LININGS FOR CARPETS.

At a time of year when 'spring cleanings' are looming before us, it will not be without advantage to call attention to the 'Cedar Felt' for underlying carpets and floorcloths. This material has been described on a former occasion, but it is of so unique and sanitary a character that it cannot be too widely known. It is manufactured by Messrs. C. Davidson & Sons, Limited, paper manufacturers, of Queen Victoria Street, and Mills, 66 & 68, Scotland, its special quality, from the sanitary point of view, being that the essence of cedar wood is incorporated in its make to such an extent that it will retain its properties for years. The pleasant odour, peculiar to cedar wood, is well known to be inimical to insect life, and consequently a preserver of carpets from the ravages of moth. The effect of the 'Cedar Felt' in covering the divisions between the flooring-boards, likewise prevents the wear of the various joints, and gives a feeling of warmth, and an elasticity to the tread not obtainable from an ordinary paper lining. The cedar felt requires no fixing down and is very inexpensive.

THE CLEANSING OF WATER-CISTERNS.

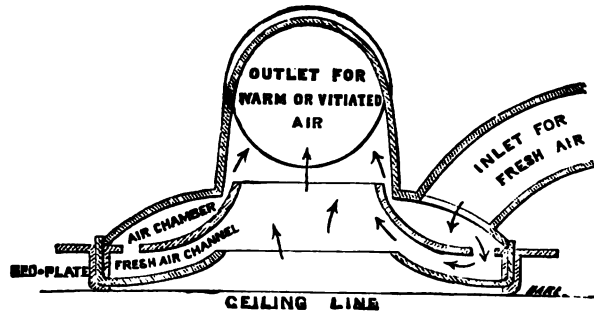
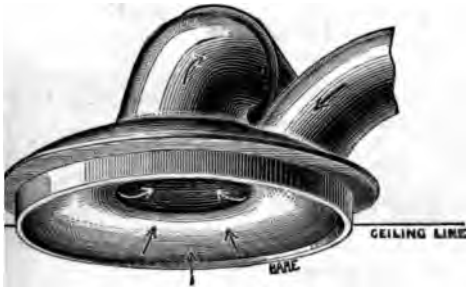
The cleansing of the water-cistern is one of the troubles that beset the householder, for, unless a man or a boy is employed on the premises, the cistern goes on from month to month, accumulating dirt and filth, until it not infrequently becomes a breeder of disease. Sir Francis Bolton in his monthly reports continually draws attention to the imperative necessity of cleansing water-cisterns, as it frequently happens that the water delivered pure by the companies is rendered unwholesome by the foul state of the receptacles in which it is stored. This state of things need no longer continue, in London at least, for an Association has been formed at 447 Strand, having for its object the cleansing of water-cisterns at so small a fixed charge that no person who values the purity of the household water supply can object to pay. On receipt of a letter a man is at once sent to the writer and the work is done. The company state in their circular that, for an annual charge they will cleanse the cisterns at fixed periods.

es during the year. The idea is a novel one, but if the risk is well done, the undertaking will, doubtless, command much public support. The previous knowledge of expense incurred will, presumably, induce many persons have their cisterns cleansed who have hitherto been deterred from having that highly necessary work done, by the terrors of the 'unknown quantities' contained in the subsequent 'little bill' presented by the plumber.

R. F. H. SMITH'S PATENT AUTOMATIC SYPHONIC SYSTEM OF VENTILATION.

Some years past Mr. Fredk. Henry Smith, of 52 Queen Victoria Street, E.C., has paid great attention to the subject of ventilation, has expended large sums of money, and spent the greater portion of his time perfecting a system of ventilation which is now complete and ready for practical application. This system was first practically carried out in what is known as the 'Island Room,' that is, the apartment in the centre of the block in the South Kensington Gardens where the electric lighting of the fountains was manipulated during the time the International Health Exhibition was open last summer, at only during the later part of the season, when its beneficial effects on the health and comfort of the six persons employed in the work were distinctly admitted. Mr. Smith has now fitted up one of his rooms at Queen Victoria Street, with the appliances, which the writer has recently had an opportunity of examining, and by a

and unbroken stream. This is effected by means of two plates or discs, specially arranged one over the other, the fresh air having to pass through a series of small holes which break it up into small streams, filling the intervening space between the two, and eventually mixing with and being carried off with the vitiated atmosphere. The size of the appliance is of course regulated according to the capacity of the room. But this arrangement is only for carrying off the foul air. Fresh air is admitted from the outside by tubes brought down the sides of the room; instead, however, of entering it at the usual level of about seven or eight feet from the ground, Mr. Smith discards all preconceived notions, cuts away about one inch from the bottom of the skirting boards nearly the entire area of the room, and boldly brings in his fresh air on a level with the ground. It may be supposed by some that draughts would result from this arrangement, but no room was ever freer from such objections as the one in which this mode of ventilation is carried out; in fact, freedom from draught is one of the especial features of Mr. Smith's invention. Objection may be urged that in still or foggy weather the automatic action may be rendered *nil*; but, although such an argument may apply to some modes of ventilation, it does not do so in this case. Syphonic action is at work constantly, regulated by the requirements of the room. Thus, if one person only is in the apartment, sufficient fresh air is provided for him; if the number of occupants be multiplied, so the action increases: each person gets a proper supply, while the extractor is multiplied in its work in



lengthened stay in the apartment of practically testing the results. The system is undoubtedly novel, simple in its construction, and, being based upon natural laws, is unerring in its effects. It is in the Vitiator Air Extractor, which is illustrated above in section and elevation, that the inventor has concentrated most of his ingenious efforts, with the result that it is not dependent for its action upon any mechanical appliances such as steam, gas, or water jets, or even a simple cowl; all being performed automatically by natural law, and doing its work evenly and effectively at all times of the year, and in all weathers. Mr. Smith's assumption is that to effectually ventilate a room and draw off the vitiated air, a somewhat similar arrangement must be adopted to the action of the respiratory organs of the human frame, or, in other words, that a ventilating appliance should be enabled, so to speak, to 'aspire' and 'expire' within the radius of its own contents. On reference to the illustration it will be observed that the 'levator' consists of a plate or disc, with two tubes fixed to its upper circumference, that to the right as shown in the sectional drawing aspirating the fresh air, the central tube carrying off the vitiated atmosphere. Both of these are connected with pipes that are carried along the joists between the floors to the outer atmosphere, where they are simply protected by gratings let into the brickwork. The arrows in the sectional view show the course taken by the incoming air, and also the vitiated air rising to the central tube, which is the larger of the two; thus the weight of the hot air through the outlet tube induces a current of cold air in the smaller one in one continuous

and similar ratio. If the gas be lighted, the extractor still further exerts itself to preserve a cool and healthy atmosphere. Such is the principle of Mr. Smith's automatic syphonic ventilator, which will doubtless be appreciated by every practical mind.

NEW HEATING APPARATUS.

THERE has just been placed in St. Luke's Church, Brierfield, near Burnley, a new steam heating apparatus, the invention of Messrs. Thomas Birtwistle & Co., Burnley. The apparatus is fitted up on the gravitation principle, and is easily worked with a pressure of 15 lbs. The boiler is in a cellar immediately below one of the vestries. The main pipe, which is 1½ inches in diameter, leaves the boiler and is conducted in a flue at one time used for a hot-air apparatus (which was formerly the mode adopted for heating the church) into the body of the edifice, from which branches are taken of one-inch pipes round the body of the pews in the centre aisle, and the east and west aisles. The steam is taken round in these pipes, and the condensed steam caused by circulation returned directly to the boiler, thus effecting a large saving of fuel. The vestries and the chancel are heated by the same medium—by a one-inch pipe passing round the outside walls. At the extreme end of the west portion of the church is fitted up one of Leed's patent steam coils, which radiates a very large amount of heat, thus warming the cold air which is brought to the church by the opening and closing of the doors. A sufficient quantity of pipe has been fixed in

order to allow a thorough system of ventilation which is about to be adopted, and which will consist of inlets of the cold air from the outside, and outlets of the foul air from the ceiling. This will make the church one of the most comfortable churches extant, both for good ventilation and efficient heating. The inlets are admirably arranged for ventilation at both seasons of the year, being for warm air in winter time, and in summer time for currents of cold fresh air. The whole of the joints in connection with the apparatus are made of Birtwistle's metallic steam joint packing, which is provisionally protected, and the adaptability of them for such purposes will be apparent when it is stated that the construction is of such a finished character as to render the slightest leakage impossible. In this church there are between 130 and 150 joints, which have been tested by a pressure of 60 lbs. to the square inch, and they have borne the test in a manner that has given unqualified satisfaction. This system of heating churches and chapels commends itself for many obvious reasons. In the first place the cost of working is very small indeed (much less than required for hot air or hot water apparatus), the cost of erection is by no means expensive, and the time in which an edifice like Brierfield Church can be heated comfortably throughout at a temperature of 70 or 80 degrees, is but three-quarters of an hour. Another feature, and by no means an unimportant one, is the entire absence of any unpleasant smell proceeding from the working of the apparatus. It may be remarked that this is the first church in the United Kingdom which has been heated with steam. The system appears to be likely to commend itself for adoption for similar edifices and public buildings generally.

IMPROVEMENTS IN FOG SIGNALS FOR RAILWAYS.

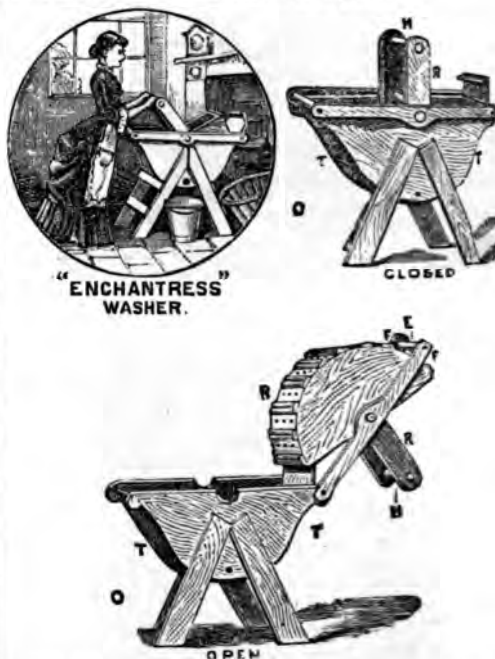
AN important improvement in the mode of fog signalling is about to be introduced by Messrs. Morrison, Ingram, & Co., of Manchester, who have filed a specification, which has been accepted (Ingram's patent), for this purpose, and which, we understand, has received the approval of some eminent railway engineers. Few persons unconnected with the working of railways can be aware of the large sums of money that are annually expended by the different companies in fog signalling, which amount to many thousands of pounds. As an instance, on one of the principal lines running into the cotton metropolis, whose junctions and connecting lines extend about a mile and three-quarters from the terminus, each foggy day costs the company about 3*l.* 15*s.*, and when we remember that the approaches to every town of any importance have to be similarly treated, the cost may be easily imagined. But, under the present system, difficulties present themselves that the passenger who has to travel on such occasions is, perhaps, fortunately for his nervous temperament, not aware of. Fog signalling is now carried out mostly by the platelayers attached to a company, and, as fogs often make their appearance when not expected, and when these men have left work, the danger to life often assumes serious proportions. On Saturdays, for instance, these men, like most other artisans, are paid and discharged early in the day. A fog comes on, and they have to be collected to guard the lines. This is often a difficult matter, and the travelling public run great risks. By Mr. Ingram's invention the appliances which are automatic are under the control of the general signalman, who has only to move a lever when that portion of the line under his supervision is immediately guarded, and the driver of an in or outgoing train is warned. The new invention consists of a range of metal tubing, two ends of which culminate in powerful whistles, the other finishing in an India-rubber 'sack' or bag, and when not in actual use the whistles are thrown out of gear by reversing a lever by the signalman in his cabin. When required for use the drawing of a lever places the mechanism, which is of a simple character, into instant action, whereby immediately

a wheel goes over them the whistle is sounded, and this is kept up as every wheel passes over it. As automatic action is generally preferable to that dependent upon human agency, it may be presumed that the new signal will be more reliable. Beyond the first cost the expense will, in the opinion of those best able to judge, be comparatively insignificant; and if greater security to life can certainly be secured, our railway companies will not begrudge the necessary outlay connected with the invention.

THE PATENT ENCHANTRESS WASHING MACHINE.

THIS machine is constructed upon different principles to any hitherto introduced. One material difference is that it is not made of any ironwork, the substances used in its manufacture being wood and sheet zinc. There are several advantages resulting from these materials, the machine thus made being very light and portable—a great consideration where back premises are confined. All iron-moulding is avoided, and in case of accident any damage can be mended by a common carpenter in a few minutes at the outlay of a trifling sum.

The essential parts consist of a tub 'T' and a rocker 'R.' Both are furnished with wooden rubbers; those of the rocker are seen on its circular surface in the open cut, and those in the tub are so arranged as to almost touch those of the rocker when rocker is in position.



The tub stands upon four legs, and has a hole to let water out, and the back is raised somewhat, and furnished with a ledge to catch inside of rocker when the machine is open, by which means rocker is held in place as shown in 'open' figure. The rocker is supplied with a frame, merely so that it can be elevated from the tub without lifting it out. It is attached to this frame by two axles. When the rocker is lowered on the tub these axles fall into and work in the two receptacles shown in the edge of the tub in the same cut.

To wash, the machine is opened and half filled with hot water, then the operator takes say six or eight shirts and soaps them, and places them anyhow in the tub. Now she lets down the rocker, as in closed figure, and having grasped the handle, 'H,' between the two uprights,

about eight rubs by pulling and pushing this and from her, always standing at the lowest end of the machine. The circular cut shows exactly the *crandi*. Then she throws up the rocker, turns over, gives six or eight rubs more, and they are washed in considerably under one minute, with all the buttons on.

It is explained that when in operation the rocker on its axis gives a rotary and general motion to the rubber between the rubbers on its surface and those on the fabric.

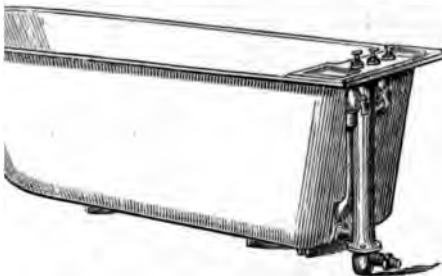
The greater portion of the friction being on the fabric, the machine is constantly used for lace curtains, antimacassars, &c. It is as cheap as 35s. places it in the reach of many, and, being so portable, neighbours frequently machine between two or three houses. In fine, it occupies but little room when not in use; stands on 3 feet by 2 feet. The rubbing action being so, it uses less soap powder, &c., than any known machine.

The entire freedom from cog-wheels, weights, and complicated machinery, renders it not only safe in the hands of children, but easy to be understood and used by the most inexperienced in machinery.

Its capacity extends from the washing of a few collars to that of a rug 3 yards square. It is manufactured by Taylor, Kingswinford, near Dudley.

THE 'VICTORIA' BATH.

MORRISON, INGRAM, & Co., of Tonman Street, Glasgow, have recently commenced there the manufacture of cast-iron and other baths, an industry as yet the first-named hitherto almost exclusively confined to Scotland, and have patented an improved bath under the above title. In this bath, illustrated in the accompanying drawing, the water, both hot and cold, enters on a level



the bottom, and both at the same time. By this the usual noise attendant upon water entering from the level is entirely avoided, and the great body of water is unobtainable attendant—is reduced to a mere trickle. It will be seen that the valves are not covered with work, and are consequently free of access at all times. The waste-pipe is large, and the lever for opening it is in the form of a 'quadrant pull.' There is a wood overflow pipe, with a tell-tale arrangement made with it. A moulded porcelain plate, with soap and brush dishes, extends across the end; most complete in its arrangements, and desirable in its details. Notwithstanding the advantages described, it compares favourably in price with many of a similar character.

THE NEW HYGEIA CLOSET.

Devices that have of late been made to simplify water-closets and to divest them of their surrounding woodwork have been commented on by Mr. D. J. Ebbetts in the *Sanitary Record* of Jan. 15, 1885, have received a

further extension by the introduction of the Patent Self-contained Hygeia Closet. Messrs. Morrison, Ingram, & Co., of Hygeia Works, Manchester, sanitary engineers and manufacturers of considerable repute, are the inventors of this apparatus, of which an illustration is appended. It is novel and slightly, and will undoubtedly be received with



much favour. The outer casing is made entirely of earthenware in one piece, and into this, the closet itself, of an improved 'wash-out' type, is placed, the surrounding space being entirely filled in with concrete, making the whole a solid body. The use of the concrete filling is obvious, as it prevents all fear of leakage. The only wood-work about the closet is the seat, which, being hinged, when lifted up enables it to be used as a slop-sink or urinal. The fixing of the Hygeia is reduced to a minimum, and altogether will be found of the most economical character, and the shape of the pan is such that perfect flushing is secured.

DIETETIC NOVELTIES.

CLARK'S COFFEE EXTRACT.

THE simple operation of making coffee in the old-fashioned way is nowadays considered too troublesome and wasteful, and various coffee extracts, which merely require mixing with hot water or milk to produce the stimulating beverage, are fast taking the place of the roasted berry. The latter loses, indeed, its aroma so rapidly, especially after it has been ground, that a really good cup of coffee is not always readily obtainable, and the coffee-consuming public will not take to the Continental habit of roasting and grinding the berries each time a cup of coffee is to be made. Amongst the most successful of coffee extracts is that of Messrs. E. Clark & Co., Optimus Coffee Works, Queen's Road, Battersea, who have lately kindly shown to the writer their processes of manufacture. Their success is chiefly owing to the careful attention bestowed by them upon the three following points; selection of the best and most aromatic coffee, devoid of excess of acidity; production of an extract without possible loss of the highly volatile aroma, and freedom from any addition of any substitute whatever.

As to the first of these points every coffee drinker must have observed that there is an enormous difference in the character of the infusions, even of perfectly pure coffee. Some are strongly acid, and this acidity naturally becomes concentrated in the extracts, and in some brands in the market is very noticeable. It causes such extracts to disagree with many persons. Messrs. E. Clark & Co.'s manager, Mr. Whitehead, by dint of long experience as a coffee merchant, has acquired the faculty of distinguishing between coffees suitable and those not suitable for his process of manufacture in an acute degree. In the second place he has succeeded in avoiding, by the retention of the full coffee aroma, the physicky and stewed taste and odour which characterise some former coffee extracts. And lastly, he makes a speciality of pure extract. Whatever

opinion may be held as to the legitimacy of the employment of chicory, there can be no doubt that all admixture of the root with the berry impairs the flavour of the infusion, although giving it the appearance of fictitious strength.

The samples which the writer has seen manufactured and tested were perfect in every way, and the public favour which they have already acquired testifies to the fact. It is evident that Messrs. Clark & Co. have been going the right way to work.

REVIEWS.

Sanitary Protection. A Course of Lectures by W. KAYE PARRY, M.A., Bac. Eng. T.C.D., Examiner in Sanitary Engineering, King's and Queen's College of Physicians, Ireland, &c. Dublin: John Falconer, 53 Upper Sackville Street. London: E. & F. Spon, 16 Charing Cross. New York: 35 Murray Street. Illustrated.

ALTHOUGH much has been said and written upon this subject in widely varied ways, it has been for the sister isle to produce one of the most exhaustive and practical works which has yet appeared on the question of immediate house drainage. A striking peculiarity being the fact that it is condensed into three lectures, which were delivered in the Theatre of the Royal Dublin Society, under the auspices of the Dublin Sanitary Association, during the current year. The unsanitary condition of the city has long been a matter of note, and the exigencies of the evil have occasioned a counteracting development of energy to try and mitigate the prevailing causes, and the Sanitary Association may be congratulated upon the way in which its precepts are expounded. In the first lecture Mr. Parry starts with the 'Principles of Sanitation,' and how far these principles are violated. The scientific introduction treats concisely and clearly of the hydrostatic and hydrodynamic forces called into action, and the flow of liquids through channels as one branch of hydraulics is duly referred to and illustrated by simple diagrams. It need not, however, be thought that these are too scientific and technical for the ordinary mind; there is throughout a touch of popularity which renders the lectures unusually interesting.

Formulae and data are given for ascertaining gravity and force, and the retarding forces or friction as applied to liquids are given as follows:—'Firstly, the friction is independent of the pressure, that is to say the resistance to motion in a pipe with a great head or pressure is the same as that in one with a small head. The second law is that the resistance is proportional to the surface exposed. The resistance is also inversely proportional to the volume, because the greater the volume, compared with the resisting area, the less will the velocity be retarded. If water be allowed to flow over a flat surface, inclined at an angle to the horizon, the retardation produced by the resisting surface will be very considerable, and the velocity of flow will be proportionately small; but if the same quantity of water be permitted to flow through a circular pipe, inclined at the same angle to the horizon as in the former case, the velocity of flow will be found to be considerably increased.' It goes without saying that these *dicta* are known to those who have any knowledge of statics, but in a numerous audience there will be many to whom such a preamble is very necessary, to enable them to understand how important are these influences when drainage work is under consideration. Illustrations are given of the sectional area of drains and sewers of different sizes containing the same quantity of liquid, so that a comparison of the extent of the resisting surface is seen at a glance. To set air in motion is the most important consideration in connection with the ventilation of drains, and the forces by which this is

effected, viz., natural ventilation and artificial ventilation, are clearly explained, the acting forces of natural ventilation being, diffusion, the winds, and the difference in weight of masses of air of unequal temperatures—this last being the most effectual means whereby a current is set up. A little knowledge is a dangerous thing, and there are many who, possessed of this slight acquaintance, imagine that if they ventilate a soil-pipe, merely by carrying it up to the top of the house that all is well, forgetful or rather ignorant of the fact that there must be an inlet for admission of fresh air, otherwise there can be no draught, and the so-called ventilator is merely a safety-valve, in case the gases in the drain become compressed. The lecturer has called attention to this point, and wisely so, as there are many instances of this merely provisional arrangement.

The effect of barometric changes upon sewers is noted, and it is shown that sewage will be enabled to carry a larger volume of vapour of water if an increase of barometric pressure takes place, and it will also retain more of the noxious gases generated by decomposition; and, similarly, a fall in the barometer will be followed by a considerable disengagement of gases. 'Air held by water is subject to the same laws as free air under like conditions of pressure. Increased temperature of the water is accompanied by dilatation and consequent escape of the pent-up air, and the decrease in barometric pressure also tends to the expansion and escape of air.' Variations of temperature and atmospheric changes have, therefore, great effect upon sewers, and this is a consideration often overlooked by those who suppose that the difficulties of drain-ventilation are readily met on a cut-and-dried principle.

The second lecture on 'Practical Drainage' is full of useful views and comparisons, which even the most learned need not disdain to follow. The leading types of intercepting-traps are reviewed impartially, and other men's ideas freely admitted. The many defects in workmanship, of which Dublin has its full share, are commented upon, and the different systems of good work are generally described in a way which commands the reader's attention.

The third and last of the series is upon 'Sanitary Plumbing,' and here, of course, is a large field for the refutation of fallacies. The different forms of water-closet apparatus are summarised with a verdict in favour of the 'wash-out' or wash-down principle; the good points of the 'valve' are recognised, however, but the lecturer looks to the former to be the lines on which the closet of the future is to be founded; the old pan-closet is illustrated and condemned, together with its inseparable D-trap. The other fittings, such as sinks, baths, lavatory-basins, and cisterns receive a certain amount of attention, and the lectures are concluded by a summary of the advantages to be obtained and maintained by good construction and periodical inspection by competent authorities.

Nature's Hygiene. By C. T. KINGZETT, F.I.C., F.C.S., &c. Baillière, Tindall, & Cox. 1884.

THE second edition of Mr. Kingzett's work has been much enlarged, and, to some extent, re-written.

Intended as it obviously is for the use of the general public, the first three or four chapters of the book are necessarily somewhat elementary, constituting, in fact, a kind of preliminary educational treatise on chemistry for the benefit of the uninitiated.

The chapters on Water-Supply and Analysis, and on the Disposal of Sewage by Irrigation and Chemical Processes are, however, not merely replete with sound teaching for the multitude, but also contain matter of such importance that it may well be recommended to the attention of the sanitary legislator. Mr. Kingzett is of opinion that, by a system of separation of the solid from the liquid portion of sewage, the utilisation thereof might be carried to the

manufacture of 'other valuable commercial commodities in addition to manure.'

The subject of contagious diseases is next introduced, and is followed by a description of antiseptics and disinfectants. The views of various pathologists on these points are fairly recorded, and their opinions on the great and important subject of the relationship between micro-organisms and disease are detailed at some length. The author himself inclines to what he calls the chemical theory of contagious diseases, *i.e.* he would attribute the morbid action of pathogenic micro-organisms to the formation of poisonous excreta during the performance of their vital functions. This view of the question does not, of course, diminish the practical importance of the germ theory, since, if there were no micro-organism, there would be also no poisonous excreta—*sublatâ causâ, tollitur effectus*.

We cannot see that Mr. Kingzett's illustration of the different effects of the alcoholic and acetic ferments upon solutions of sugar and alcohol respectively throws any light upon the attenuation of the virus of chicken cholera by the action of time and exposure to air upon the cultivated liquids employed for inoculating that disease.

Excess of alcohol kills yeast, and thus puts an end to the alcoholic fermentation of sugar, but a new ferment must be introduced to set up conversion of the alcohol into acetic acid. Even granting that the products of the life-action of the micro-organisms of chicken cholera are altered by oxidation, so as to be rendered comparatively innocuous, yet it is known that the organisms in the attenuated virus have not lost their power of reproduction altogether, for they will multiply in a fresh cultivation-fluid; therefore, when introduced into the blood of a healthy chicken, unless the organism itself has been changed by the process of attenuation, finding itself surrounded by suitable pabulum, it would surely produce excreta possessed of the same virulence as its original progenitors. Whether, therefore, we accept the view that the micro-organism produces the disease by the poisonous nature of its excreta or not, it is clear that the organism itself must be modified by the process of attenuation, and that the result is a modification of the disease in its host.

The chapter on the Treatment of the Sick is very good, though we should have been interested to hear Mr. Kingzett's opinion concerning the action of some other disinfectants besides 'Sanitas.' The merits and *modus operandi* of Sanitas are, however, very fully and clearly set forth, and there can be no doubt that it is both a disinfectant and also a powerful antiseptic, whilst it possesses the advantages which are rather uncommon in bodies of this class of being agreeable to the olfactory organs, non-poisonous, and not corrosive.

The second part of the book contains an interesting account of the author's researches into the production of peroxide of hydrogen in nature, notably during the oxidation in presence of moisture of essential oils containing 'terpenes,' *i.e.* hydrocarbons of empirical formula $C_{10}H_{16}$. The beneficial effects of the Eucalypti and the Pines in counteracting miasmatic influences are very fully discussed.

There seems every reason to believe that the hope of the author expressed in his preface will be fulfilled, and that his book 'will prove useful to many.'

A Code of Rules for the Prevention of Infectious and Contagious Diseases in Schools. Being a Series of Resolutions passed by the Medical Officers of Schools Association, Jan. 7, 1885. London: J. & A. Churchill.

A CODE of rules for the prevention of infectious and contagious diseases in Schools, drawn up and published under the directions of the Medical Officers of Schools Association, comes before the world with a degree of authority which renders the task of criticism easy. The

code will undoubtedly become the standard authority on the matters with which it deals, and will be of the greatest service to medical officers, not only, or chiefly, on account of the information with which it presents them, but because it will strengthen their hands in dealing with governing bodies and head masters.

The code is short, condensed, and dogmatic. Section I. deals with general hygienic considerations, such as drainage, water, milk, and laundry. Section II. is concerned with the arrangements of the infirmary or sick-room. Section III. with the medical examination of scholars on admission; it recommends that a primary certificate should in every case be handed in; enumerating the infectious diseases from which the child has already suffered, so that on the outbreak of an epidemic the medical officer may at once know what dimensions it may assume; a form is given for this primary certificate, and also a set of forms for certificates under other circumstances; Form No. II. is to be presented by the pupil on returning to school after a holiday; it is a certificate that the pupil has not been exposed to any infectious disease during the holidays or during the last three weeks of them. Form III. is for use when the pupil has recovered from infectious illness at home. Form IV. for use after exposure only to infection. Form V. for the use of the school authorities, to be sent by them to the parent when a pupil has recovered from an infectious disease and is about to be sent home. Form VI. is also for use by school authorities where a child who has been exposed to infection at school is sent home. In this place it may be observed that the dispersion of a school on account of the outbreak of an epidemic is strongly deprecated; such a step places a great responsibility on the shoulders of the school authorities, and the code lays it down that such a responsibility should only be taken when the mischief can be traced to some local sanitary defect, which can only be remedied when the pupils are absent; in other cases parents should be informed of the presence of the epidemic, and advised to remove their children, or not to do so according to circumstances. Section V. in which the regulations on this matter are given is entitled, 'Measures to be adopted when an infectious disease has appeared in a school;' it deals also with isolation of the earliest case, the management of the isolation ward, the disinfection of the dormitory, the treatment of doubtful cases, and the important question of the date at which patients may be allowed to return home or to school. Here the code is, quite properly, very dogmatic except in one case; the rule given for whooping-cough is too indefinite, and errs, many will think, in naming too short a period of isolation. Section IV. contains the general precautions against the introduction and spread of disease from neighbouring towns, by day pupils, and tradesmen; the possibility that the medical officer may help to disseminate the disease is also taken account of, and the use of a mackintosh, after the manner widely popularised by Mrs. Priestly, is recommended.

It would be difficult to exaggerate the value of this code, which ought to be carefully studied by every schoolmaster and in the hands of every parent.

A Report showing Seven Years' Sanitary Progress in the District of Torquay. By CHARLES MACMAHON, Sanitary Inspector. Standard Office, Torquay.

THIS report, printed by order of the Local Board at Torquay, of 'Seven Years' Sanitary Progress,' will be found well worthy of notice. It is compiled by Mr. C. MacMahon, Sanitary Inspector of the district, who may be heartily congratulated on the seven years' work of which he treats.

The report is divided by him into three parts—*viz.*, His work (1) as Inspector of Nuisances; (2) As Surveyor of New Buildings; and (3) As a House Sanitary Engineer.

Under the first head he mentions the number of houses examined by order of the Local Board, as, also, the

several large buildings, such as the Town Hall, the Post Office, &c., which he was called upon to inspect; and then continues: 'special reports, stating the defects found, or the modern sanitary arrangements required, having reference to drainage, trapping, disconnection of waste-pipes from drains, ventilation of drains and soil-pipes, sanitary closets, and water supply, were prepared by me, and sent to those asking for them. My recommendations have been, in nearly all these buildings, carried out under my personal direction and supervision. With regard to all work, which I either order or recommend, I have made it a rule to examine it at least once daily during its progress. No pipe of any kind is either laid, fixed, covered, or cased in without my direction or permission. Thus a fair execution of all work is secured.'

From 1878 to 1884, both inclusive, 4,639 sanitary operations were effected in 2,390 separate houses or premises; and only seven legal proceedings were instituted before the justices.

As to the *value* of the work done, the number of houses visited in 1878 was 64, and the cost of works 128*l*. In 1884 the houses numbered 112, and the cost was 560*l*.

As to the testing of drains, the following is an extract:—

'I have used a volatile, strong-smelling oil, in order to discover defects in soil-pipes, drains, &c., without putting people to the expense of opening up floors and walls. I am pleased to be able to state that such testing may be invariably relied on. If the slightest odour escapes, there is a defect; if not, the drain or soil-pipe is sound. Many pounds have been saved in this way. If the test is properly applied, the *exact spot* where the fault or defect exists is found out.'

With reference to the examination of new buildings the following may interest our readers:—

'I found considerable deviations from the plans, &c., lodged with and approved of by the board, so much so that in some instances very little resemblance existed between the houses as erected and the plans, except, perhaps, the positions and outlines of the buildings. The ventilation of drains and soil-pipes was looked upon as superfluous and detrimental to the appearance of the houses, and was very indifferently carried out. In one noteworthy instance, I found by mounting to the roof, a piece of two-inch iron pipe cemented to the slates, *concealing inside* the actual ventilator, which was a 3-inch lead pipe, the object of the little dodge being to pretend that a 2-inch ventilator had been fixed as specified in the builder's agreement with the board. Rooms were sometimes found to be less than the minimum height (8 feet) allowed by the by-laws; and very frequently small bedrooms had no means of external ventilation provided; party walls not carried above the roofs; cisterns without covers; no ashpits or boxes; yards left around the backs and sides of houses in a wet, undrained, unpaved state were common faults. The houses themselves were now and then found so damp that the plaster on the inside walls was easily impressed with the finger, and gave off huge tears of moisture, which coursed each other down the walls. Thus there was considerable difficulty in ensuring the proper healthy condition of new houses. The builders, I am pleased to say, now know what the board requires, and, as a general rule, carry out the by-laws, with the result that the new houses are in sanitary particulars satisfactory.'

The third head, that of 'Superior House Sanitation,' is the one which would probably commend itself more especially to every one of us, as individuals; we do not encourage the existence of 'nuisances' around us; we do not all build new houses; but we must all of us live somewhere, and we are responsible not only to ourselves and to our families, but to all in our neighbourhood, for the healthy condition of the houses in which we live. The following anecdote is amusing, and we would only wish that every one going to the seaside, and on the look-out for lodgings, were as particular as the 'gentleman coming to Torquay by the "Dutchman"' in this narrative. 'On Oct. 13 last, when I was about to proceed on my rounds

with my day's programme well filled, an occupier of a house rented at 120*l*. per annum came into the office in great trepidation. He asked "to have his house examined at once, as a gentleman was coming to Torquay, two days hence, by the 'Dutchman,' but he would only take the house upon the production of a sanitary certificate on his arrival." I examined the house, wrote the report in one of the rooms, and the owner was quickly put in possession of it. The alterations required involved the fixing of an entirely new closet in lieu of a very bad one, a water-supply to the same, the disconnection of a pantry-pipe from the soil-pipe, repairing defects in the base of the latter, found by testing, and lastly, the improvement of the water supply, as the scullery and pantry were supplied from w.c. cisterns. These works were in full swing the following day, and on the day after, with the certificate in my pocket, I finally examined the works about five o'clock in the afternoon, and the nervous occupier, whose living for the winter had been in jeopardy, was made happy, and able to rush off and meet his six months' tenant with the essential document. Thus it will be seen that I am bound to place my services at the disposal of any ratepayer or intending occupier, and upon the briefest notice, the work to be done involving the credit and well-being of the town, as affording safe houses for our visitors and residents.'

The following is the conclusion of this admirable report. The Torquay Local Board did good service in having it printed, and we feel it right to congratulate them on the work done, and on the energy and zeal of their sanitary inspector.

'The foregoing is an account of seven years of domestic sanitation in Torquay, carried out during what may be called the transition period of sanitary science. The change from locked-up, choked, clay-jointed, over-trapped, or untrapped, or masonry drains, and sometimes cesspools, to cement-jointed, self-cleansing, well-ventilated pipe conduits, having a single easily flushed trap between the house and the sewer; also from corroded metallic, double-trapped unventilated water-closets and insufficient water supply to simple glazed earthenware basins, having a single syphon trap, with full width extended soil-pipe above the roof for ventilation, and other outlets and inlets for the same purpose; syphon action flushing cisterns for closets; likewise the alteration from the sole supply of water for all purposes being drawn from one uncovered cistern under the roof or other unsuitable place, to separate and covered cisterns for the different purposes, and taps upon the main water-pipes for the purest supply. In brief, from fever-inviting, sickness-disposing dwellings to healthy homes, which, next to healthy bodies, must be the greatest of earthly blessings. The revolution (for such it is) is being quietly accomplished. With its unimpaired natural beauties, its perfect sewerage system, and pure water supply, if is added to these the great desideratum of the age—healthy homes—it cannot be too much to say that Torquay is the healthiest, as well as the loveliest place in the United Kingdom.'

Science and Art of Modern Plumbing as Applied to Domestic Purposes.

The Removal of Sewage and the Drainage of Dwellings.

Both by J. W. HUGHES, Plumber, &c., Montreal.

THESE are two pamphlets, being reprints of lectures delivered upon the subjects named. The one we have placed first is, at the same time, the most ambitious and the least satisfactory. It is divided into five chapters—i.e.—I. Hydraulics of the Plumbing Trade. II. Domestic Sewerage, &c. III. The Hot-water System of our Dwellings. IV. Plumbing Apparatus and Fixtures. V. The Plumber and his Boy. These lectures are far too slight and inexact to be of general use, though they have probably answered their ostensible object in suggesting to the younger members of the craft subjects for special study. If we refer to Chapter III. we find diagrams of

five different systems of installing a domestic hot-water service, but no description is given of the different systems, or any hint afforded as to the author's experience of their relative value. In Chapter II. a diagram is shown of a very ingenious combination of pipes, traps, and valves, which the author made use of in experiments directed to test the syphonic action upon traps under varying circumstances. But the experiments themselves which, if properly conducted, would have been of great value, are not even referred to. Again, in Chapter IV., the author enumerates accurately enough the various kinds of closets, and states the various points which he considers should be attended to in the selection of one, but he does not attempt at all to show how these requirements are met in the various apparatus, but leaves his readers to apply his tests to a hundred different closets as well as they may. The last chapter contains several extracts from American writers concerning the trade, and the two following quotations will show that the American plumber is the object of the same unappreciative *badinage* as his English brother craftsmen. The *New York Herald* some time since said, 'Three weeks ago the writer sent for a plumber who never appeared, but yesterday he sent in a bill,' to which the *Courier Journal* replied, 'You ought to be happy. There are some plumbers who would have kept you waiting a week longer for your bill.' A correspondent of the *Philadelphia News* is supposed to ask, 'Why is it that when a plumber comes to fix the pipes he always has to go back and get his tools?' To this the editor makes answer: 'Probably because a long and careful examination convinces him that he can't repair the damages without tools.'

The second pamphlet on the drainage of dwellings is a very good *résumé* of the American system of house-drainage, containing many very practical hints and written in a methodical manner not often discoverable in the works of practical men.

If we look for the special circumstances which affect plumbing work in Canada we shall find them in the severe and protracted frosts of winter and the heavy snowfalls. Consequently we find considerable space devoted to the means to be employed in protecting plumbers' work, &c., from injury by frost. Our author omits the disconnecting trap on the house-drain, so generally insisted upon in England, because in winter the cold air, entering by it and ascending the drains and soil-pipe, is likely, in his opinion, to freeze the contents of the traps, and so cause great mischief. Mr. Hughes prefers to connect the house-drains direct with the sewers; but as the sewers have road-ventilators spaced some forty to fifty yards apart, the air entering by these ventilators could be but very slightly warmed in its passage to the house-drain. So that we fail to see what anything material in the direction of warmth is gained by the omission of the disconnecting trap.

A chapter of this very practical work is given up to the protection of pipes from cold. The author divides the precautionary measures to be taken into four heads:—1. Preventive measures as regards position or situation; 2. Protection; 3. Mechanical action; 4. Emptying the pipes.

To take the last head first, he admits the value of arrangements for emptying the pipes during a frost at night, though, as attention is required to effect the object in view, he places but little reliance upon it.

'Mechanical action' is, in other words, allowing the pipes to run, though, as he points out, this often results in waste-pipes being frozen up solid.

Under 'protection' he describes various kinds of casings which are used in Canada for the security of pipes in long-continued frosts, and his remarks and descriptions, illustrated with diagrams, are very suggestive, and should be tentatively read by all who are interested in the subject.

The first of the four heads will be readily understood, and its importance is in the work before us very properly stated on.

We have spoken so far of that which forms the most

valuable experience to an English engineer; we will now take a rapid glance at the remainder of the work.

The laying of small pipe drains is recommended; but Mr. Hughes seems uncertain about the proper fall to be given under varying circumstances, although he would find the subject exhaustively treated of in a work to which he seems to have referred, *i.e.* 'Bailey Denton's Lectures.' A diagram shows the usual American arrangement of a soil-pipe up the centre of the house, having direct connection with the drain. The latter is not laid under the basement, but, with the object of gaining the utmost fall towards the sewer, is supported against an internal wall. The object aimed at is good enough, but the idea can hardly be effected in this simple manner as long as there are sinks and closets in the basement. The diagram shows, indeed, such a closet, but the difficulty is overcome by the naive expedient of raising it some three feet or so, and approaching it by a formidable flight of steps.

In the second chapter our author advocates the subsoil drainage of the sites of houses with proper subsoil drains, but, where these cannot be laid, he advises leaving the joints of the house-drain open, after it has left the premises, and filling round them with gravel and broken stones—a piece of advice which will hardly find acceptance amongst sanitary engineers.

Mr. Hughes's opinion as to both the location and choice of a water-closet are rather lax, though we may infer that he is greatly in advance of those for whom he writes.

As to location, after stating that a water-closet should be placed against an external wall and should be provided with a proper window, he proceeds to describe what must be done when closets have to be fixed in the interior of a house 'like cupboards.' Again, he says, 'It is bad practice to fit water-closets in the centre of a building, but sometimes it cannot be avoided.' Surely no writer should admit for a moment the possibility of such an arrangement. The pan water-closet is admitted to be a bad apparatus, but the possibility of its use is contemplated. Certainly it is insisted that it should be taken down and burnt out 'twice a year,' and anyone who had to face the expense and annoyance of these half-yearly cleansings would, we fancy, soon find it desirable to procure a more reasonable and effective apparatus. The advantage of fixing plumbers' work with the minimum amount of woodwork is insisted on. (See SANITARY RECORD for Jan. 15, 1885, page 304.) The author sees no necessity for the usual boxing-up as he says, 'Everyone knows what the apparatus is; no object is gained by trying to make it look like a writing-desk or jewel-case.'

It seems that, though many materials have been used for kitchen sinks, the popular one in Canada is plain cast iron (not enamelled), and in connection with these it is pointed out that the holes in the gratings are generally too small and the waste-pipes too large to be effectively flushed by the discharge—a fault which we have constantly had to remark upon ourselves.

There are many terse pieces of practical advice scattered through the pages of this useful little work, but we have only space to call attention to the chapter on cleanliness.

There was a time when a housewife would feel herself disgraced if every nook and corner of her house were not kept clean and spotless by countless scourings and sweepings. Nowadays the use of disinfectants, powders, and soaps has given a sense of security resulting in a sad falling off in the scourings and cleansings of fifty years ago. We will conclude our notice of this work as our author does, with the following recipe written by a physician in answer to a patient's request for a good disinfectant to use during the warm weather:—

'R.—Brush, 1; pail, 1; shovel, 1; wheelbarrow, 1; broom, 1; cloth, 1; soap, *ad lib*; *agua pura*, quantum suff. (plenty of clean water). Add a sufficient quantity of brains and muscle to cause the whole to be vigorously worked, and use in large quantities until complete relief is afforded.'

NOTES ON BOOKS.

Johnston's Registered 'Clerk of Work' Sheets. Morison Bros. 99 Buchanan Street, Glasgow.

THIS sheet is an elaboration of the form which is usually employed upon buildings of importance, or upon which a clerk of works is employed. It is often highly necessary to ascertain the cost of labour expended upon a work either during progress or at completion, and it is only by careful analysis of this description that such a result can be arrived at, either to settle disputes, arrange prices, or furnish statistics which are so often required. The value of material can always be more or less accurately determined by measurement, but time expended upon building works must be recorded, otherwise it is impossible to arrive even at an approximate estimate of labour undergone. First among the many influences at work to impede operations is the weather, which will often make or mar the profit upon a building transaction; accordingly we find the usual space for work and time stopped under unfavourable conditions. The lines allotted to the numbers and dates of drawings, letters, &c., received from the architect are insufficient, as two or three clumsily-written figures would fill these spaces, and the same remark would apply to 'Drawings required.' There is plenty of room, however, for 'Remarks,' and that boon to the builder and bane to the architect, 'Extras.' In the interests of the great unemployed it is much to be hoped that the 'busy' portions of these generally useful and compact sheets will be largely filled, not only in the north, but in all four quarters of the kingdom.

Rules to be observed by Nurses in Charge of Infectious Diseases in Hospitals and Private Houses. By Rev. J. H. TIMINS, M.A., F.G.S. West Malling: W. G. Chamberlain.

ISOLATION, fresh air, and perfect cleanliness are the three great requisites in the nursing of cases of infectious disease. The author of this little pamphlet apparently places most reliance on the use of certain 'disinfectants,' for the use of which he gives minute instructions. In our opinion these are calculated to do harm indirectly by withdrawing the attention of the nurse and other attendants from the vitally important points we mentioned above, and also by imparting a false sense of security, provided certain almost superstitious rites are complied with.

Jahresbericht über die Fortschritte und Leistungen auf dem Gebiete der Hygiene, im Jahre 1883. Von Professor Dr. UFFELMANN in Rostock. Braunschweig: 1884.

THIS year-book, which appears as a supplement to and uniform with the *Vierteljahrsschrift für öffentliche Gesundheitspflege*, will be found an indispensable companion to the student of hygiene. It contains notices of every work, pamphlet, and article of any importance that has appeared in the English, French, German, and Italian languages during the year, the precise references being given as footnotes. Military hygiene alone is excluded, as having in Germany an organ of its own. The contents are arranged under twenty principal heads or sections, and full indexes of subjects and of authorities are appended.

The compiler has evidently read each production with some care, for it is remarkable how clearly he gives the gist of each, and picks out anything really new or of special value. It is, therefore, not a mere index, but an epitome and a review, and as such will save the student much labour and time, frequently indeed rendering actual reference superfluous. The statistics given under infectious diseases, for example, are as complete as any one could wish. It is impossible for us to give anything like an abstract of a work containing in 240 pages references to the literary contributions of about 600 different writers.

CORRESPONDENCE.

Audi alteram partem.

[All communications must bear the signature of the not necessarily for publication.]

VENTILATION OF PUBLIC SEWES

Mr. C. Bond has asked two or three very questions upon sewer ventilation. I will answer the best of my ability, and in a practical way from experience sadly injurious to myself, of which I will give an account. I am of opinion, and have been, that the only correct way to ventilate sewers means of up-cast shafts from the crown of the sewer at given points, carried up above the eaves of the building which are in close proximity, but not into a shaft to any chimney. For one reason above all other is a danger, keep as far from it as you can. I think there is the danger that many imagine of the gas blowing down the chimney. My reason for this is in consequence of tests I have made, which I endeavour to describe, and, after that, give some for the result. First, I had a gas stove on which an iron vessel filled with cold water; the lid was carefully sealed. From the top of the lid I fixed over a tube of 2 inches diameter a tube, 2 feet 6 inches long, turned down nose, through which I got steam pressure when the water was boiling. I then placed a glass cylinder, 6 inches diameter, on a box, 10 inches high, with an aperture in one side, 4 inches diameter, air into the box. I placed the turn-down nose into the top of the glass cylinder, through which I distinctly see the action of the steam, and, as I said, I could not get the steam down the cylinder more than 2 inches before it took a direct and rapid up-cast, closed the aperture in the box, and cut off the air; the result was the steam travelled about 2 inches into the cylinder, and the up-cast was considerably high, but in no instance could I get it down into the sewer. I understood the experiments were made in a room and secondly in the outer air, so I had introduced external air to give me the results alternately. I came to the conclusion that there is not to be apprehended by many of sewer-gas blowing down a chimney, and for a reason obvious to me, as if sewer-gas will blow down a chimney, the room chimney that would admit of that would always be so; it is evident that there would be a down-cast as well as an up-cast. Taking the average of chimneys the percentage of smoky ones is very small. Not only so, it does not happen because a chimney smokes that sewer-gas will blow down.

For instance, when sewer-gas leaves the up-cast shaft it has to be carried by the air or wind to the hood of the chimney, and if it carry it there why not the chimney? I dare not think any scientific man there is a sufficient down-cast in a chimney to suck, and unless it so acts it is a thousand chances against the gas blowing down, and it is utterly impossible for it to do so if a fire is burning and the gas escapes. That being so, anyone can satisfy him smoke *versus* sewer-gas. If a sewer be properly ventilated by the means of up-cast shafts the pent-up gas will be exhausted, and the generation from day to day be reduced to a minimum. Street gratings to be a mistake, as it is clear that all the escape from a tendency to travel upwards, and the chances as will inhale it in its course. True, it may become still the deleterious effects are as sure, if less rapid, as gas escape at an altitude of 35 or 40 feet, a height at which the air is never stationary. Supposing it should it would become more distributed and consequently less injurious. I know of a fashion where some three years ago the Corporation was

to open all the town gratings, and in less than forty-eight hours the whole town was impregnated with sewer-gas. After this experience the gratings were closed. These facts prove that the gas will escape at any opening. I have for years advocated the closing of the ground line gratings and the substitution of up-cast shafts, and I believe this will have to be done before a perfect system of sewer ventilation is accomplished. The sewer-gas from street gratings is just as dangerous if inhaled as though it was inhaled in a house, the only difference is that with the gas in the open air more oxygen is inhaled with it and it is more diluted, but, in proportion to the amount inhaled, so is the effect. I feel sure there is not one person out of every thousand knows the dreadful effects of sewer-gas upon the human system. Where it is detected it is usually treated as an unpleasant smell, and is so passed by; and, further, it is often attributed to something else, such as greens-water put down the sink by a thoughtless servant, when in fact it is one of the most deadly enemies with which man comes in contact, and which under the present system of drain ventilation he cannot avoid. To my own cost and sorrow I have of late had this fact so forcibly impressed upon me, that in whatever form sewer-gas approaches me, or however disguised, it will be difficult to deceive me.

I will now give a short account of my experience of sewer-gas and the dreadful ravages it makes. In March of last year I with my family occupied a certain house in the suburbs. Within a space of five days from taking possession the whole six in family and the servant had continual bad headaches. We then began to detect a bad smell at times. In fourteen days my eldest daughter had a very severe attack of persistent diarrhoea. The stench increased each day as the drains became more used. Within two months the whole of us (except the youngest boy of thirteen years, the reason for whose immunity I will explain further on) became so debilitated that we were unable to keep about for more than a few hours at a time. My own case was that of wasting of the flesh, so that in eight weeks I lost in weight 16½ lbs. My wife, eldest son, and youngest daughter were in the first stage of diphtheria. At that period small blood blisters began to show themselves on the back of my hands. We were under medical treatment over two months before our medical attendant could pronounce us safe. This gentleman pronounced the illness of myself and family to be blood poisoning, brought on by bad sanitary arrangements, and ordered us to leave the house immediately. This we did, and within eight or nine weeks we no longer needed medical attention. During the time we occupied the house I made many complaints to the landlord, but all the satisfaction I got was he thought I was very particular. Such cases as these should surely not be left wholly to the mercy of a landlord, but part of the evil should be remedied at the fountain head—the sewer. It is now nine months since we left the house, but we still feel the injurious effects caused by bad sanitation. As I previously mentioned, the youngest boy escaped, on account of being in the house only at night. I hope I have given some idea of the dangers of sewer-gas, and a remedy against the dangers.

I shall be prepared at any given time to go through the experiments I have before named, on any number of scientific gentlemen giving me notice of their desire to see them.

EDGAR ALDOUS.

Ventilating and Sanitary Engineer.

2 Elmhurst, Upton Lane,
Forest Gate, E.

A NEW DEPARTURE IN HOUSE DRAINAGE.

Allow me to express the satisfaction I felt upon observing that Mr. W. P. Buchan had found time, whilst rearranging the awards of the Health Exhibition, to notice a humble contribution of mine to your pages.

Sanitary engineers have for years steadily worked at the problem of house drainage with, I hope, some success ;

but now they need trouble themselves no more upon the subject, as Mr. Buchan, in his usual diffident manner, has finally informed us as to which arrangement it is that may claim the title of 'first-class style.' As to that other arrangement of mine, alas, it appears that it must be content to regard itself as 'second rate,' whatever that may be.

Mr. Buchan is the maker of a trap designed to be fixed at the foot of a soil-pipe—an excellent trap of its kind, no doubt. But as the adoption of my proposal would tend to abolish the use of such traps, I am not altogether astonished that he does not regard it with favour.

As to my proposal being new, I carefully guarded myself on the subject in the article in question. Several persons have been good enough to tell me of cases in which they supposed that the system I described had been used. But upon inquiry in each case I found they were very different, though they bore, may be, some resemblance to my work in this or that detail.

One detail which is found in several arrangements that I have inquired into, is a double soil-pipe with trap at foot, which would provide for the ventilating the soil-pipe in the natural way, *i.e.* in the direction of the flow of water, and it is simply the adoption to a *soil-pipe only*, of the principle which I suggest should be completely adopted throughout waste-pipes, soil-pipes, and drains; using the least possible number of traps, and relying upon one effective ventilation pipe for the entire system.

Feb. 20, 1885.

D. J. EBBETTS.

AWARDS AT THE HEALTH EXHIBITION.

By request of Jury No. 9 of the late Health Exhibition, we forwarded, at the commencement of last August, several filters, which the circular stated were 'to be tested.' They have just now been returned to us, and, to our astonishment, we find that they have *not* been tested, not a drop of water having ever been passed through them. You will understand that the nature of spongy iron renders it easy to affirm this with certainty. It appears almost unnecessary to point out that the only known way to test filters as to their sanitary merits consists in a chemical and microscopic comparison of water before and after filtration through them. Such testing can, indeed, have been the only reasonable object in retaining filters for almost seven months, extending far beyond the close of the Exhibition.

Surely nothing could show more clearly the hollowness of at least some of the awards made by the jury. Will the committee or the jury allow this stigma to rest on them as a body, or will they name the individual who is responsible for the blunder? It is perhaps expecting too much that that party will have sufficient courage to come forward himself and explain by what means he arrived at his conclusions, which were opposed to all scientific and practical evidence on the subject.

THE SPONGY IRON FILTER COMPANY.

T. G. MILLER, Manager,

[We are requested to publish the following correspondence, which may probably be taken as typical of much past, present, and to come.—ED.]

E. C. Owen, Esq.,

Secretary,

Inventions Exhibition,

South Kensington.

Sir,—I am in receipt of your printed notice refusing my application for space at the above Exhibition. As that application referred to several patents which have not been shown at any Exhibition, I shall feel obliged by your informing me on what ground my application has been refused, and the more so as I happen to be aware that you are at the present time promising space to people who have not as yet sent in any formal application, much less as I did within the stipulated dates. I would call your attention to the fact that I was an exhibitor of three of my patents at the International Fisheries Exhibition,

and in addition to which I ventilated the offices of the executive, the lecture theatre, the fish dining-room, and south wing gratuitously. My exhibits were amongst the most attractive features of the Exhibition, and drew crowds of people to inspect them. Nevertheless, although the jurors recommended an award, the Executive Council overruled their decision on the ground of my exhibits being foreign to the object of the Exhibition. This objection was quite unfounded, as ship ventilators and working models of ventilated holds of steam trawlers were amongst my exhibits, and were specially examined by the jurors. In the Health Exhibition I again applied for space, including not only my former patents, but several new ones. I was offered about as much as was equivalent to the superficial area of a single compartment of a first-class railway carriage, although at the same time literally acres of space were being allotted to jams, pickles, and sugar-plums. In the present Exhibition, although I have again added to my list of novelties, my application is wholly refused, the cry having gone up for

the attention of the public to the circumstances of the case. Yours faithfully, (Signed) R. OAKLEY
235 High Holborn, W.C.

Dec. 24, 1884.

International Inventions Exhibition,
South Kensington, S.W.

Dec. 27, 1884

Dear Sir,—I have received your letter of the 24th inst. and regret to have to inform you that the decision of Council, as previously communicated to you with reference to your application for space at this Exhibition, must be considered as final. Yours faithfully,

(Signed) EDWARD CUNLIFFE OWEN, Secretary.
R. Oakley, Esq.

'HOUSE-DRAIN VENTILATION.'

We have read with much interest the remarks which have appeared in your columns on the above subject, and there is one point which we should like to urge. If

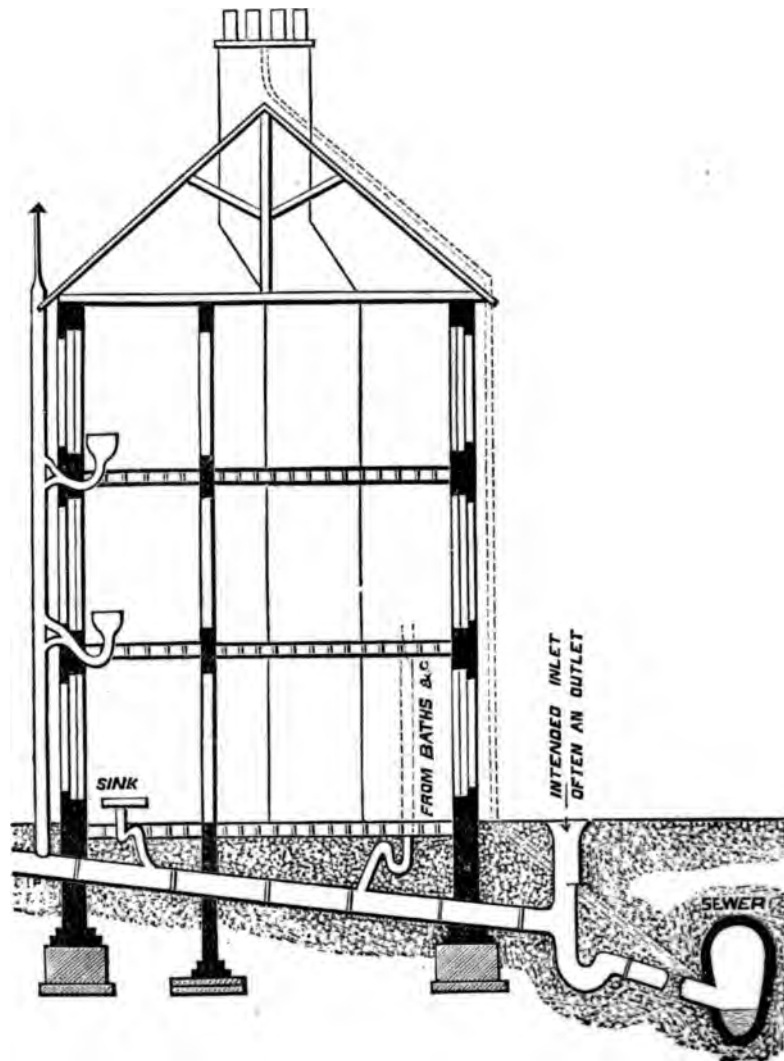
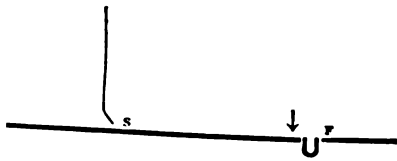


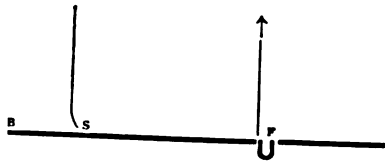
FIG. 1.—Diagrammatic.

'more jam.' The executive and the *personnel* being practically identical throughout the three Exhibitions, the course pursued is no doubt dictated by one mind. Unless I receive a satisfactory reply to this letter, I intend to call may be allowed to say so, we would suggest that there has not, as yet, been sufficient distinction made between 'House-Drain Ventilation' and 'House Drainage,' 'appliance' and the 'system.'

regards the 'ventilation of house-drains.' The
vernment Board By-laws suggest two schemes—



inlet (in front of house), B = outlet (at back of
The soil-pipe being at—say s ;



inlet (at back of house), F = outlet (in front of
ing soil-pipe.

In either of these cases the normal ventilating current
would not, we imagine, be materially affected whether
matter were passing down the soil-pipe or not.

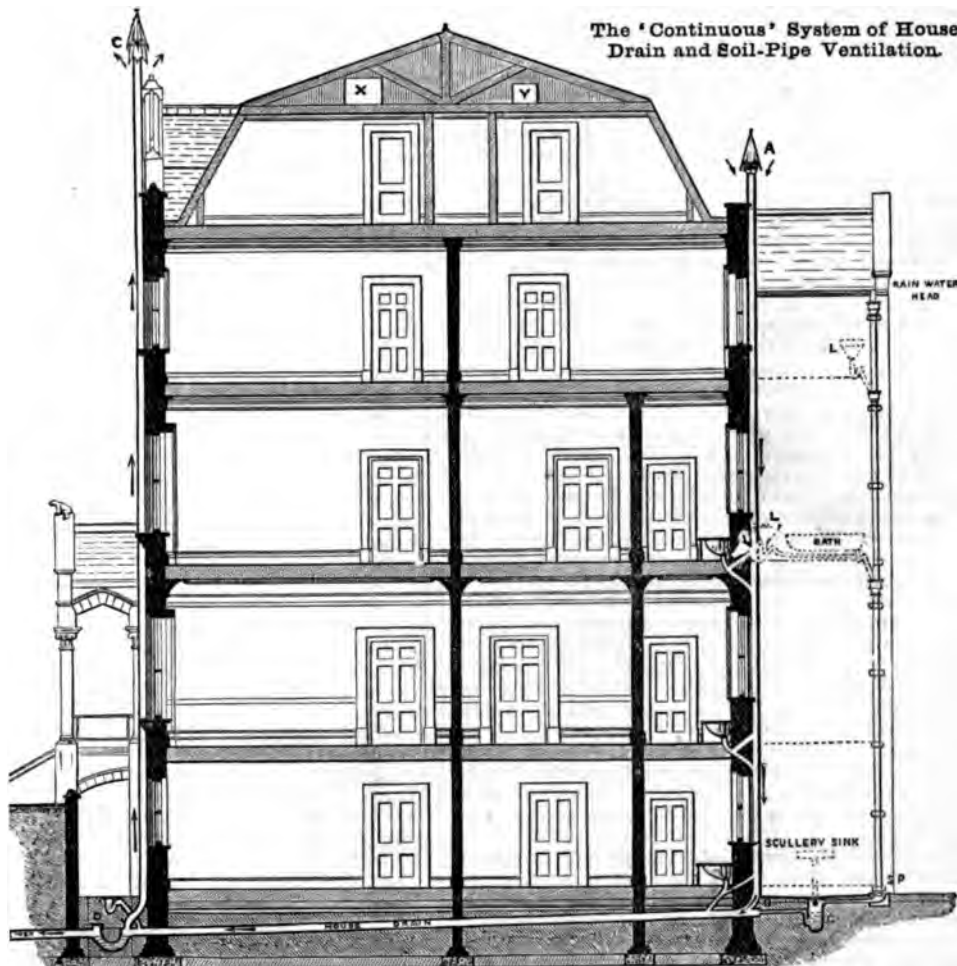
If, however, the soil-pipe take the place of the upcast
ventilating shaft, then, during the 'reversal of the current'
in the soil pipe, the foul air would be emitted from the
aperture intended for the inlet. (Fig. 1 shows such a
plan.)

But, on the other hand, if the soil-pipe is made the
downcast ventilating pipe, the effect is to ventilate both
house-drain and soil-pipe with one continuous stream of
air, which is stimulated by the passage of matter down
the soil-pipe, no 'reversal of the current' being possible.
(Fig. 2 shows such a scheme.)

It is a system of ventilation which we have adopted for
some years past, and will, we think, stand on its own
merits.

Next, with regard to the question of sanitary appliances
in general, and dip-traps in particular. For our own part
we thoroughly endorse the opinion that a dip-trap is a
'useless impediment in the passage of the sewage from
the soil-pipe to the drain' (Knight's 'By-laws,' p. 102).
Moreover they increase the cost of sanitary work, and are
therefore undesirable.

The sooner it is clearly understood that a scheme of
drain ventilation should, for its success, be independent of



The 'Continuous' System of House-
Drain and Soil-Pipe Ventilation.

FIG. 2.—Section of House.

Arrows denote direction of currents of air participating in Ventilation of House Drain.

Injecting Ventilator.	A B Soil Pipe.	L Lavatories.
Disconnecting Trap.	G Cowper's Grease Trap.	X & Y Cisterns.
Ejector Ventilator.	S P Splash Pit.	

any special sanitary appliance (which can, of course, be costly or the reverse) the better for the public health, the public purse, and the cause of sanitary science as well.

SHARP & CO.

LAW REPORTS.

SUPREME COURT OF JUDICATURE.

COURT OF APPEAL.

Ballard v. Tomlinson.

THIS appeal raised an interesting and important point as to the right of one or two owners of wells having a common source of supply from underground water to restrain the neighbouring owner from so dealing with his well as to cause the water which the other owner pumped out of his well to be polluted. It appeared that since 1849 the plaintiff, a brewer at Brentford, drew the water for brewing from a well sunk to a depth of 222 ft. into the London clay and bricked round. From the bottom of the well a pipe was carried through the Thanet sand into the chalk, to a depth of about 300 ft. from the surface. From the sand and chalk, which were water-bearing strata, the water found its way by natural pressure into the well, from which the plaintiff raised it by pumping. About ninety-nine yards from that well, the defendant also had a well of similar construction and going down to about the same depth in the sand and chalk, but the surface of the ground was about 10 ft. higher than at the plaintiff's well. The evidence was to the effect that both wells were supplied from the subterranean water. The defendant, having ceased to use his well, made a drain by which the sewage was discharged into it. The plaintiff complained that the sewage had polluted the water in his well, and he claimed an injunction to restrain the defendant from so using his well as to pollute the water in, or coming into, the plaintiff's well, and also claimed damages for the injury caused by the pollution. For the plaintiff it was argued that, though there can be no property in underground water flowing in natural undefined channels, and therefore a landowner may so deal with such water as to deprive his neighbour of it entirely, yet he cannot so use his well as to prevent his neighbour drawing pure water. It was also said that the defendant's well and pipe were artificial channels, so that he was responsible for the consequence of allowing sewage to flow into the well. The fact of the pumping, it was said, could make no difference, for in either case nature would fill the vacuum caused by the abstraction of the water. For the defendant it was argued that he had not polluted any water in which the plaintiff had any property, and that if the plaintiff chose to draw the water from the common supply he must take it as he found it; and, further, that the effect would not have been caused but for the plaintiff's act in pumping. Mr. Justice Pearson gave judgment for the defendant (*see* SANITARY RECORD, March 15, 1884, p. 447), being of opinion that the plaintiff had no greater right to the quality of the water than he had to the quantity, and that it was one of the incidents to the use of the water that the plaintiff should take it subject to everything which had occurred to it by reason of the use of it by other landowners before it could reach his land. From that judgment the plaintiff now appealed.

Their lordships delivered judgment, allowing the appeal.

The Master of the Rolls said that it could not be denied that sewage had been collected in an artificial shaft on the defendant's land, and that it had percolated or been drawn through by the plaintiff's act into the water under the plaintiff's land, and that it had fouled that water. It was clear that no one has at any time any property in water percolating below the surface of the soil even while it is under his land. But it was equally clear that every one has a right to appropriate such water

and may prevent it from going on to the land of others. So his neighbour below may cause such water on the land above to come upon his land, and may absolutely deprive his neighbour of it. Therefore no one has any property in percolating water, but every one has a right to appropriate the whole of it. The percolating water is a common reservoir or source, in which no one has any property, but from which any one has a right to appropriate any quantity. Then the question arose whether any one of these who have that unlimited right of appropriation, but of whom each has no greater rights than the others, has a right to contaminate the common reservoir, or whether he is bound not to do anything which would prevent any of those persons obtaining the full value of their right. It was true, as suggested, that the defendant by polluting the common reservoir did not pollute that in which the plaintiff had any property. If all the plaintiff could show was that the common source was contaminated, he could not before he had appropriated any part of it, maintain an action in respect of that contamination. But it did not follow that he could not maintain the action when he had appropriated it, if there was evidence that the water which he had a right to appropriate had been contaminated by that which another person had done to the common source; in other words, although no one has any property in such a source, yet, inasmuch as every one has a right to appropriate it, he has a right to appropriate it in a natural state, and no one has a right to contaminate the common source so as to prevent his neighbour having his right of appropriation. As to the point that the pollution would not have been caused if the plaintiff had not used artificial means, and, therefore, that it must be taken to have been his act, that was not a true proposition. The question of natural, as distinguished from unnatural, user never applies to plaintiffs, but only to defendants. As long as a person does not use any means which are unlawful as against his neighbour, however artificial or extensive those means may be, he has a right to use them, and the right to appropriate the common source is not diminished by such user. The question of natural and unnatural user only goes to this, that although a defendant does contaminate water or anything else which goes on to his neighbour's land; yet, if that act is only what has been called the 'natural user' of the land, and although by that act the neighbour is injured, the defendant is not liable, because, otherwise, he could not use his land at all. With regard to the common source the question does not depend upon persons being contiguous neighbours; but if it can be shown that in fact the defendant has contaminated the common source, it signifies not how far the plaintiff may be distant from him, if it can be shown that the plaintiff has been injured by the act of the defendant. Therefore, upon a question which was uncovered by authority, his lordship was unable to agree with the learned judge. The ground on which he disagreed was that no one has any property in percolating water, which, as it comes from a common source, every one has a right to appropriate but no one has a right to injure.

Lord Justice Cotton was of the same opinion. The right to underground water was a natural incident of the ownership of land. The defendant was not exercising that natural right, and was not taking the underground water, but was putting upon his land filth which got down to the underground water which was partly under his land and partly under the land of the plaintiff. As soon as the defendant's act interfered with the plaintiff's natural right of ownership there was a cause of action.

Lord Justice Lindley delivered a written judgment to the same effect.

FISH-POURING A NUISANCE.

Houldershaw v. Martin.

This case raised a question under the Public Health Act 1875, as to what is a 'nuisance,' and whether or not it must be injurious to health. An information had been laid against a fishmonger at Liversedge, near Dewsbury,

e, for causing a 'nuisance' by the smell of frying there was, according to the provision in the Health Act, 1875 (38 & 39 Vict., cap. 55, sect. certificate of a medical man to that effect—that it was a nuisance, the words of the statute 'nuisance or injurious to health.' The magistrates, rejected the certificate as insufficient, because it did the words 'or injurious to health,' though the the Act are not conjunctive but disjunctive, and refused to entertain the complaint. (See SANITARY, Jan. 15, 1884, page 372, and May 15, 1884, p. 41.)

Complainant appealed, but Lord Coleridge said the too clear for argument. The medical certificate was sufficient, for the words of the Act were 'a nuisance or to health' (not 'and'), and there might be a not injurious to health, or there might be some injurious to health though not a nuisance, so that the certificate was quite sufficient, and, indeed, an indictment this enactment (if it were an indictable offence) that the thing was 'a nuisance and injurious to health' would be bad, as being double and alleging two offences. Consequently the case was sent back to the magistrates.

THE TRUTH ABOUT A DUST-HEAP.

Andrews v. Mansfield.

As an action arising out of an injunction which the plaintiff had obtained to restrain the defendant from digging into a field opposite his house, so as to cause a nuisance by means of an offensive smell injurious to the plaintiff's health and comfort. The interim injunction had been confirmed by the Court of Appeal, but by order of the court it was not to be made perpetual until the question of fact whether there was such a nuisance as had first been ascertained by a jury. Hence the inquiry.

The plaintiff was the owner of a small freehold at Stratford. There he carried on the business of a gardener, and his premises was a field which was rented by the defendant and used for the purpose of carting dust and

The carts would have to pass the plaintiff's premises, and he complained in the first instance of the dust occasioned by the dust and paper which were taken to his house as the carts passed. Later in the year the weather became warmer, and particularly when it was both warm and wet, the dust heap, which was 100 yds from his house, began to throw off noxious gases, and it became so bad as seriously to affect the health of the plaintiff and his family. A plague of flies next settled on the heap and added to his discomfort, and about a month later the heap was sifted into what is called soft and fine dust, the smell became so intolerable that the plaintiff, under medical advice, was obliged to leave the house and take his family to the seaside to recruit their health.

Several neighbours confirmed the plaintiff's story, as having themselves suffered from the smell, and three doctors were called, one of whom described the heap as a mixture of abominations.

In the defence, as usual, an equally strong body of evidence was called to contradict the plaintiff's story. Several witnesses were produced who said they had smelt no dust, and several scientific witnesses were called who said they could detect no smell beyond that of ordinary dust-bin, but that it was physically impossible under the circumstances that there could be a smell as alleged, one of these witnesses, Dr.

Tidy, declaring his opinion that such an idea was ridiculous, as the noxious gases from the heap must have been oxidised before they could have reached the plaintiff's house. It was also a part of the defence that, if such a smell as that complained of, the true cause was to be traced to other causes existing in the neighbourhood.

The jury eventually found a verdict for the plaintiff, and Mr. Justice Stephen thereupon gave judgment

and granted a perpetual injunction to restrain the defendant from continuing the nuisance.

ALLEGED EXCESS OF WATER-RATE.

Henderson v. The Folkestone Waterworks Company.

The question here, as counsel said, was novel. The plaintiff, the owner and occupier of a house at Folkestone, had been, as he alleged, rated by the water company in excess of what was held to be legal in Dobbs's case in the House of Lords, and he had paid the amount demanded of him under the impression that he was bound to do so, and now he sued the company to recover back the excess. The company, on their side, set up that it was a voluntary payment and not recoverable. The plaintiff set up in answer that it was paid by compulsion. But the Court found as a fact that the payment was voluntary.

Lord Coleridge said the law was quite clear that the plaintiff could not recover back this money. No doubt when money paid under an error in law had been extorted or obtained by duress or any kind of compulsion it could be recovered back, but that was not the case here. The law once ascertained to have been against the party who had thus by compulsion obtained payment of the money, it can be recovered back. But here at the time the money was paid, which was before Dobbs's case, the law was in favour of the company, and there was no authority to show that it could be recovered back on account of a judicial decision reversing the former understanding of the law. Moreover, in this case the payment was voluntary, and the assessment had been altered as to the future. If the plaintiff desired to dispute the assessment he could have applied to the magistrates to reduce it under the statutory power so to do. The law, however, did not allow money voluntarily paid under a mistake in law to be recovered back.

Mr. Justice A. L. Smith concurred, and observed that though the amount involved was small the principle involved was important, and the question had been decided in our Courts nearly a century ago. The learned judge cited two cases to show this, and added that he had never heard it doubted that money paid voluntarily, though under a mistake in law, could not be recovered back.

Judgment for the defendant.

SALT IN BEER.

At Lambeth, H. H. T. Martine, late of the Orchard Tree beerhouse, Camberwell New Road, was summoned at the instance of the Camberwell Vestry for selling beer or ale, being an article of food, which was not of the nature and substance and quality of the article demanded by the purchaser, contrary to the provisions of the Act for the Sale of Food and Drugs. A discussion took place with regard to the section on which the summons was to be heard. One section (the 3rd) dealt with the alleged offence on the ground that the article sold was 'injurious to health,' but ultimately it was agreed to go upon sect. 6 of the Act, which included the words in the summons. Mr. Biron, the magistrate, said he was fully of opinion that that would be the best course to adopt. The certificate showed that salt had been added to the beer to the extent of 187·6 grains per gallon, and if so, that was 'not of the nature and substance of the article' demanded. Dr. Bernays said the fact was as stated, and the amount of salt mentioned was after allowing a margin. The witness said he allowed 70 grains. He had examined many samples of beer, but had never before found such a quantity of salt in them, or anything like it. Mr. Hughes, who appeared for the defendant, pointed out the instructions given by the Local Government Board with regard to this question. Dr. Bernays said it was in those instructions deemed advisable not to interfere unless the mixture was over 100, and in the present case it was 190. Mr. Biron said it was a case of great public importance, and quoted the 35 & 36 Vict., sect. 3 and 6. He thought the section which was passed later on was intended to spread a net, as it were, over a wider space, as in a case like the present.

He therefore must convict, but thought a moderate penalty would meet the case, and ordered the defendant to pay a penalty of 20s. and 1*l.* 13s. 6*d.* costs.

A CORPORATION SUMMONED FOR A NUISANCE.

At the Jarrow Police Court, a summons which had been obtained by Dr. W. Whammond against the Jarrow Corporation for creating a nuisance and allowing it to exist on land to the east of Monkton Road was heard. Mr. Webber, who appeared for the prosecution, said there were 2,000 tons of night-soil exposed to the air, except at one part; and they intended to trace a case of scarlet-fever to the nuisance which it had caused. Dr. Whammond was called, and he produced samples from the heap, and they caused a very bad smell in court. Dr. Munro, Medical Officer to the Corporation, stated that, though a nuisance had existed at the place referred to, there was none existing at present. Dr. Bradley corroborated Dr. Whammond's evidence. Sarah Bulman, living in Salem Street, stated that one of her children had been attacked with scarlet-fever, which she attributed to the deposit of night-soil. Several residents in the neighbourhood gave evidence that they had suffered in health from the deposit. Mr. Thomas Gibb, one of the magistrates of the borough, said there was a space 50 yards by 17 yards, which was not covered with clay. He was certain that decomposition would always take place as long as water ran through the bottom. Mr. Joel, who appeared for the defence, called Dr. Hardcastle, of Newcastle, who said that he had gone over the place and found no smell. The fluid sample brought that morning was surface-drainage. Mr. Petrie, the Surveyor, and Mr. Baty, the Sanitary Inspector of the Corporation, gave evidence that no nuisance existed. The magistrates, after a long consultation and inspection of the place, decided that there was no nuisance existing within the meaning of the Act. No costs were allowed.

SHOCKING NEGLECT.

A disgraceful case has recently been brought before the notice of the Lanchester Board of Guardians, showing much neglect. An old man named Jonathan Garbutt, who resided at The Allotment, Low Waskerly, a secluded place near Consett, was some time ago stricken with a severe illness, from which he never rallied. He had no other attendant but his wife. As he got worse his body gradually became decomposed and the skin discoloured. The stench arising from his body was so terrible that none of his friends or neighbours dared to venture near the dirty hovel called his home, which became a public nuisance. At length the poor fellow's legs appeared to be rotting away, severing themselves from his trunk, whilst the agony he suffered was so dreadful that he frequently tore large pieces of flesh from his body and threw them away. Death put an end to his sufferings on September 10, when the parish authorities did not consider it their duty to provide a coffin for him; he was therefore buried something after the manner of a savage living amongst barbarians, which has caused considerable indignation in the neighbourhood. The defence of the relieving officer was that he considered deceased's relatives quite able to pay for a coffin. The clerk of the guardians was directed to write to their medical officer asking why he had failed to supply disinfectants to purify the foulness of the premises.

A CORRESPONDENT of *Invention* suggests that people who use warm water-bottles and India-rubber bags, would find a bag of sand far more convenient. The sand should be fine, clean, and thoroughly dried, then put into a flannel bag made about 8 in. or 10 in. square. The opening should be carefully sewn up, and the bag covered with linen or cotton cloth, to prevent the sand from sifting out. The bag may be quickly heated by placing in an oven or on a stove. The sand holds the heat a long time, and imparts a more agreeable warmth to the feet or hands than a warm water-bottle.

THE HOUSING OF THE WORKING CLASSES.

*How best to help the slender store,
How mend the dwellings of the poor?*

THE PEABODY FUND.—The trustees of the Peabody Fund announce that when the buildings in course of erection are completed, they will have spent the whole of their capital. Up to the end of last year they had provided for the artisan and labouring poor of London 10,144 rooms, occupied by 18,453 persons. The average weekly earnings of the head of each family in residence at the close of the year was £1 3s. 8*d.* The average rent of each dwelling was 4s. 8*d.* per week, and of each room 2s. 1*d.* The birth-rate for the year reached 44.60 per 1,000, which is 10.93 per 1,000 above that of all London for the same period. The death-rate, including the deaths of those inhabitants of the buildings who were removed to hospitals, was 19.10 per 1,000, which is 1.24 per 1,000 less than London. The infant mortality was 138.69 in each 1,000 births, or 13.69 below that of London.

IMPROVED INDUSTRIAL DWELLINGS COMPANY (LIM.) The forty-third ordinary half-yearly meeting of this company was held at the Mansion House, Sir Sydney Waterlow, M.P., in the chair. From the report it appeared that the total income for the half-year amounted to 40,788*l.* 12s. 4*d.*, while the total expenditure was 27,294*l.* 7s. 4*d.*, leaving a divisible profit of 13,494*l.* 5s., which, added to the balance of 358*l.* 14s. 8*d.*, brought forward from the last half-year, gave a total of 13,852*l.* 19s. 8*d.* Out of this sum the directors recommended the payment of the usual dividend at the rate of 5 per cent. per annum, free of income-tax. The estates continued to be maintained in thorough repair, and constant attention was given to the sanitary state of the dwellings. The estates in the central districts continued to be fully occupied, but in the outlying districts, owing to the competition which arose in the suburbs and other causes, the letting was not so satisfactory. The chairman, in moving the adoption of the report and statement of accounts, trusted that the meeting would be of opinion that from the commencement of their operations to the present time they had continued to make gradual but certain and satisfactory progress. The thrift, economy, and care which had been exercised by the directors in the earlier years of the formation of the company had been the cause of its success. Mr. Alderman Stone, deputy chairman, seconded the motion, which was adopted. The election of Mr. A. B. Daniell and Mr. D. S. Waterlow as directors, in succession to Sir C. Freake and Mr. Miles, deceased, was confirmed, those retiring by rotation being re-elected, as was also Mr. E. Hart as auditor. The chairman, in responding to a vote of thanks passed to the directors for their continued honorary labours on behalf of the company, expressed the pride which he felt at the work which had been, and was being, carried out by the company. They had now in occupation more than 5,000 tenements, housing something like 25,000 persons, and a more respectable body of people of the class to which they belonged could not, he ventured to say, be found in the metropolis or any provincial town in England.

THE eighteenth annual report of the Artisans', Labourers', and General Dwellings Company (Limited) for the year ending Dec. 31, 1884, states that from Shaftesbury Park the gross income was 24,855*l.* and from Queen's Park 53,652*l.* The loss from irrecoverable arrears during 1884 was small in both cases. Now that Shaftesbury Park and Queen's Park may be considered as completed estates, shareholders will, observe the directors, be interested to observe that the important item of repairs shows a decrease for the twelve months as compared with 1883 of 1,047*l.* This is the result of the thorough efficiency with which, for some years past, all necessary work has

. The houses are now in good repair, and their
ce in that state involves less outlay. There is a
le increase in the amount of local and imperial

The amount expended for rates, taxes, and was a net increase of 647*l.* 11*s.* 4*d.*, although a has been obtained of nearly 400*l.* on the yearly water supply on the two estates. The directors sided to create a fund for the insurance against a non-hazardous portion of the company's pro- sum of 306*l.* 11*s.*, being one year's premiums set apart out of revenue and placed to the the Fire Insurance Fund. The exceptionally ber of 1884 enabled the building operations Park to be pushed on with great rapidity, the close of the year 743 houses, including those menced in the previous year, were completed, and occupied. The development of the Hill estate has been proceeded with. The gave under their consideration the question of a central site in the metropolis for the purpose of block-building as dwellings for the industrial should the Manchester Ship Canal scheme be to effect, the value of the Salford property will be enhanced. The increase of capital during the been 125,290*l.* The net revenue for the year ec. 31, 1884, amounted to 57,611*l.*, being an of 7,820*l.* over last year. The amount available ds, including the balance brought forward from was 59,875*l.* The interim dividends, paid preference shares 1879 and 1884, and Sept. 8, y shares, amounted to 26,365*l.*, leaving 33,509*l.* ich the preference dividends for the second six f the year, amounting to 6,540*l.* were paid 38*s.*, leaving 26,969*l.* available for dividend on shares, on which the directors recommend the of a dividend at the rate of 5 per cent. per e of income tax, for the second six months of making 5 per cent. for the year. This will 1,197*l.*, leaving a surplus of 5,772*l.*, out of s proposed to carry 4,000*l.* to revenue reserve, lence of 1,772*l.* to next year's account.

MANCHESTER AND SALFORD WORKMEN'S CO-OPERATIVE SOCIETY (LIMITED).—The annual meeting of the Society was held at the Town Hall, Manchester, on Monday, 2nd inst. The report of the directors was read and approved. The report, presented by Mr. Thomas Dickins, J.P., chairman of the directors, presiding, was as follows:—

time conditions which operated adversely to the interests in 1883 have continued throughout the and the rental has shown a slight falling off. Paid, 1883, 1087. 8s. 3d.; rents received, 1884, 11d. This shows an average weekly receipt of against 2s. 1s. 8d. in the previous year. It should be noted, however, that a change was found necessary in the collection of the rents, and the receipts for the first half of the year show an increase of 3d. upon the

The new collector has been obliged to reject tenants who entirely failed to pay their rents, and has evicted a few others who were not regular in their payments. Many others, however, have been obliged to leave also, probably fearing similar consequences.

This has involved a considerable loss of rent, and is only of a temporary character, and it is to be rid of such tenants. The poverty of the poor in many cases seek to become tenants of the poor, and is such that even 3d. per week is a sufficient inducement to cause them to occupy a single room for a night in one of the wretched buildings in the slum in preference to the excellent accommodation which the company's dwellings afford. The effect of the reduction of the rents of the dwellings has been to reduce the rents of the unhealthy dwellings referred to, and it is that until the people are educated to the importance of healthy dwellings, or the Corpora-

tion close those that are unfit for habitation, the company's premises will suffer from the competition.'

The revenue account showed a surplus of 12*l.* 17*s.* 4*d.* for the year, which, it was agreed, should be carried forward, making the total surplus 51*l.* 18*s.* 3*d.*

At a recent meeting of the Plymouth Workmen's Dwelling Company (Limited), a dividend of 4 per cent. was declared, and it was announced that there was a good prospect of 5 per cent. in a short time.

PARKS AND OPEN SPACES.

*The law condemns both man and woman
Who steals the goose from off the common;
But lets the greater felon loose,
Who steals the common from the goose.*

PUBLIC PARKS.—A recent calculation shows that Paris has 172,000 acres in parks, or one acre to every thirteen inhabitants; in Vienna the proportion is one acre to 100 persons; in Chicago, one to 200; in Philadelphia, one to 300; in Brooklyn, one to 639; and in New York, one to 1,363. New York, however, proposes to buy 3,808 acres for additional parks at an estimated cost of 2,000 dollars per acre, or in the aggregate an expenditure of 7,616,000 dollars.

Lieutenant-Colonel Robinson has offered to sell thirty-two acres of land, situate on the Osmondthorpe Estate, to the Leeds Corporation for a public park for the inhabitants of the East End of Leeds, from which it is only about twenty-five minutes distant. He has reduced the price to 9,000/.

At the last meeting of the Newcastle City Council it was agreed to set apart twenty-five acres of the Nuns Moor as a recreation ground for the use of the inhabitants of that city.

SANITARY JOTTINGS.

A SANITARY Association has just been started at Preston, with the special object of applying pressure on the Town Council to take measures for the reduction of the abnormally high mortality of the borough. A successful inaugural meeting took place on the 9th ult., when a resolution was unanimously passed, calling on the Corporation to institute an inquiry without loss of time into the excessive death-rate of the town.

In 1880 the Lanchester Joint Hospital Board, in the county of Durham, after being duly constituted, resolved to build three hospitals in the union, one at Consett, another at Tanfield, and the third near Lanchester ; but on various pleas, but principally on the score of economy, the buildings have never been proceeded with. Infectious disease having again become prevalent in the district, the authorities have been urged to carry out their original designs ; and at a recent meeting of the Board, after a sharp discussion, it was resolved to proceed at once with the erection of a hospital for infectious diseases at Consett. A meeting of the representatives of the Durham Town Council, the Durham Rural Sanitary Authority, and the Brandon and Willington Local Boards, has recently been held at Durham to take into consideration the advisability of amalgamating the various authorities for the purpose of erecting a permanent central hospital for infectious diseases, for the joint use of the several districts comprised in the above authorities. After a long discussion, during which Mr. Lisle, clerk to the Durham Guardians, stated that the Boards had no power to make a central hospital,

it was ultimately resolved that each district should provide a hospital for itself.

SPREADING SMALL-POX.—Elizabeth Smith was summoned before the Darlington Borough magistrates on the 23rd ult., on a charge of exposing herself in the public street whilst suffering from small-pox, although she had been frequently warned of the danger of doing so. After medical evidence had been given in support of the case, Mr. Lindler, on the part of the Corporation, said he did not press for other than a nominal penalty, their principal object being to prevent such occurrences in future. After suitable admonition from the chairman the defendant was fined in the mitigated penalty of five shillings. Six cases of small-pox, which recently occurred at Darlington, are supposed to have originated from infection caught in the crowded tent of a travelling auctioneer. Four of the cases were removed to the Darlington Fever Hospital, with successful results. One was removed to the patient's own home, where isolation and proper treatment was possible, and that also ended in recovery. But the sixth, a stubborn patient, persisted in also being taken home, where isolation was impossible. The result was that the neighbourhood speedily became infected, and one fatal case has already occurred through culpable obstinacy.

An epidemic of measles is now very prevalent in Sunderland. The death-rate of the borough for the week ending Feb. 28 exhibited an average of 37 in the 1,000, the excessive mortality being attributed to this cause. The Corporation of Sunderland have now an improved Bill before Parliament, which, if passed, will enable them to deal more effectually with matters affecting the public health than they have hitherto been able to do. The Bill has provoked much opposition in the borough, but on a recent poll of the ratepayers a large majority in its favour was exhibited.

An excellent shelter for the use of the labourers on the Quayside, Newcastle, was opened by the Mayor of that city on the 28th ult. This is an example of kindness and consideration which we should be glad to see extensively followed.

Scarlet fever still forms by far the largest percentage of the cases of infectious disease notified to the medical officer of health for Newcastle-on-Tyne.

Dr. J. H. Raymond, health commissioner of Brooklyn, New York, says of sulphur as a disinfecting agent:—'The experience of this department, covering nearly a score of years and thousands of cases, demonstrates to our satisfaction that sulphur will, if properly applied, destroy all infection. I have never known a second case of small-pox, or other contagious disease, to break out in a house where the first case occurred, and after fumigation, in which there was even a suspicion that the house was the infecting agent.'

Arrangements have been made, in accordance with the conditions of a gift of 1,000*l.* to the Public Gardens Association, to afford immediate relief to unemployed and distressed workmen by providing them with work in the laying out of recreation grounds and accomplishing other objects within the province of this organisation. This is a timely and reproductive work in more ways than one.

The owner of eight houses at Bermondsey has been summoned by Mr. Thomas, the sanitary inspector of Bermondsey, for neglecting to put them in a sanitary condition and fit for human habitation. The houses in question were in a filthy state, without a proper water supply, and having unpaved yards. The defendant was ordered to pay penalties amounting to 53*l.* 16*s.* The owner of houses in Lamb Alley, Bermondsey Street, was summoned for a like offence, and ordered to pay 34*l.* 4*s.*

THE contract for the sanitary work and repairs of drainage of The Lodge, Merton Abbey, has been given to the London Patent Automatic Disinfecting Company, 53 Queen Victoria Street, London, E.C.

EXHIBITIONS.

PARIS INDUSTRIAL EXHIBITION, 1885.

This exhibition is being organised by M. Ducret, President de la Chambre Syndicate des Industries Diverses, at Paris, and will be held from July to November 1885, in the Galleries of the Palais de l'Industrie, which has been lent by the French Government to the promoters of this undertaking. It is now stated that the Organising Committee has decided to form three foreign sections, one for England, another for Belgium, and a third for Italy, in order that the processes adopted by French workmen may be compared side by side with the methods adopted in these different countries. By virtue of a decree published in the *Journal Officiel* of Jan. 10 last, the portions of the Palais de l'Industrie assigned to this Exhibition have been constituted a bonded warehouse. Communications should be addressed to M. Ducret, at the Palais de l'Industrie, Champs Elysées, Paris.

INTERNATIONAL EXHIBITION IN EDINBURGH.

At a meeting held in Edinburgh on Feb. 20, presided over by Ralls Clark, it was resolved to hold an International Exhibition in that city in the summer of 1886, of Industry, Science, and Art. A committee was appointed to carry out the details.

ARTISANS' EXHIBITION IN DUBLIN.

An Artisans' Exhibition at Dublin, for works of Irish Industry, is announced to be open on June 1, 1885, and it will remain open for three months. The work of all artisans resident in Ireland, and of Irish artisans wherever resident will be received. The objects to be exhibited will include hand-made and machine-made work, whether completed by one or more artisans, and whether made by them at home or in the workshops of employers. In the latter case the exhibits would bear upon them the names of both artisans and employers. In addition to the above, it is intended to include within the scope of the Exhibition a collection of pictures, an art less collection, objects of domestic industry, inventions (to be exhibited in the names of the actual inventors only), apparatus and fittings for handicraft teaching, models of artisans' dwellings and of workshops (especially those in which dangerous or unwholesome trades are carried on). In the department of home industries and art workmanship, the work of women is especially invited. To make the Exhibition as conducive as possible to the education of the artisan class, it is intended to organise in connection with it a Trades Congress, lectures, concerts, and other entertainments of a high class. Further particulars may be had on application to the Secretary, Artisans' Exhibition, Mansion House, Dublin.

LOCAL INTELLIGENCE.

At the meeting of the Newark Town Council and Urban Sanitary Authority on Feb. 5, Mr. Knight asked what were the duties of the Public Analyst. The Mayor said he was paid £15 a year as a retainer fee for his services, and any ratepayer could have food or drink analysed by him on paying 10*s.* 6*d.* If they could reduce it to 5*s.* the privilege would be used by many ratepayers to whom the fee of 10*s.* 6*d.* was prohibitory. Mr. Howe thought that the £15 was money thrown away. Alderman Pratt said the Act of Parliament would not allow the Public Analyst to be dismissed except with the permission of the Home Secretary, and another would immediately be appointed to succeed him. Mr. Howe said the fact that not a single article had been sent by the public to Dr. Ashby for analysis showed that the people were well satisfied with their milk, butter, and in might say their beer. [The good folk would seem to act on the principle that 'where ignorance is bliss, 'tis folly to be wise.'—Ed.]

Mr. Cheshire, the Public Analyst for Hastings, reported to the Town Council and Urban Sanitary Authority, at their quarterly meeting, that during the year ending Dec. 31, 1884, 37 samples were submitted to him, of which 12 proved to be adulterated and 25 genuine. As compared with last year there was a greater variety, and on more sample, also twelve adulterated samples in the place of five. Prosecutions were instituted in every case. In the case of two samples of mustard, the prosecutions were abandoned on account of some previous decisions of the superior courts, and one in respect to a sample of whisky was upset on a technical objection, otherwise all others were successful, and resulted in fines ranging from 5*s.* to 10*s.* The following is a detailed list of the analyses:—Milk, genuine, 14; adulterated, 3; mustard, adulterated, 2; raspberry jam, genuine, 4; adulterated, 1; brandy, genuine, 1; gin, 1; port, 1; butter, 1; coffee, adulterated, 4; whisky, genuine, 1; adulterated, 1. Eleven samples of water were analysed for the Authority during the year.

At the meeting of the Ashborne Local Board and Urban Sanitary Authority, on Feb. 9, the following resolution was moved by Mr. Alfred Hall, seconded by Mr. H. D. Holyoak, and carried unanimously, and the clerk was requested to forward a copy of it to Mr. Cooper:—'That this Board desires to record upon its minutes its warm appreciation of the valuable services rendered by the late Mr. Richard Cooper, as a member during many years, and its sense of his high character, business capacity, and undeviating kindness and courtesy. That his fellow members are fully sensible of the loss they have sustained by his lamented death, after a long and painful illness, and beg to tender to his widow and son an expression of very sincere sympathy and condolence with them in the irreparable bereavement they have sustained.'

The Cardiff Port Sanitary Authority have increased the salary of Mr. Joseph G. Gover, the Inspector of Nuisances, from £20 to £25 per annum.

at quarterly meeting of the Louth Town Council and Sanitary Authority, the Public Analyst reported that no had been submitted to him for analysis.

Sanitary Improvement Commissioners have been continued Sanitary Authority until March 25, 1886, by Order of the Council.

Southampton Guardians and Rural Sanitary Authority have been h urban powers, rights, &c., under so much of Sect. 44 of Health Act as is not already in force, and under the whole of Sects. 157 and 158, within the contributory place of Llanishen.

Nottingham Local Board and Urban Sanitary Authority, at meeting on February 10, passed a resolution, that the numbers be increased from nine to twelve. All the members were in favour, and (with the exception of Mr. Gravely, who did not vote) unanimous; and the Clerk was directed to apply to the Council for a Provisional Order.

Stone Town Council and Urban Sanitary Authority have elected salary of Mr. A. W. Conquest, the Surveyor, from £350 per annum.

Southampton Council and Urban Sanitary Authority of Southampton elected the salary of Mr. W. B. G. Bennett, the Surveyor, from £400 per annum.

Southampton Guardians and Rural Sanitary Authority have been h urban powers, rights, &c., under Sects. 157 and 158 of Health Act, within the contributory place of Purbright.

Stonington Town Council and Urban Sanitary Authority have elected the Local Government Board for payment, out of the sanitary grant, of a moiety of £20, the salary of the Medical Officer of Health; but they declined, unless the salary was £100, the Authority thereupon passed a resolution to keep the salary already fixed, and to withdraw the application to the Council.

Swansea Council of Cwmbran, within the Newport (Mon.) Rural Sanitary District, proposed to be constituted a Local Government District. A meeting of parishioners was held on Thursday, Feb. 19, and a resolution was passed carrying the proposal, to be forwarded to the Local Government Board by the Newport Rural Sanitary Authority.

At a meeting of the Hampton Wick Local Board and Urban Sanitary Authority on Monday, Feb. 23, the following resolution was passed:—That this Board desire to record its sense of the loss sustained by the parish in the death of Sir Thomas James, who was Chairman of the Board for a period of eighteen years, and whose vigilance and attention to the material wants of the parish, and well-being of its inhabitants, his knowledge of the law, his constant attendance at the meetings of the Board, and his uniform kindness to his colleagues, have deserved their recognition and knowledge; and the members of the Board in their own and on behalf of the parish generally, beg to offer to Lady James sincere sympathy and condolence, trusting that the high character of Sir Thomas's character, expressed by the numerous tributes which he has been connected, may afford to her and her family consolation in their distress.

Mr. Pavy, upon resigning as the Medical Officer of Health for the Parish of St. Luke, Middlesex, is to be given an illuminated testimonial on vellum, under the seal of the Council.

At a meeting of the candidates for the appointment of Surveyor to the Local Board and Urban Sanitary Authority, at £150 per annum.

Southampton Guardians and Rural Sanitary Authority have elected the Local Government Board, increased the salary of J. H. Square, the Clerk, £30 per annum.

At a meeting of the Sittingbourne Local Board and Sanitary Authority on Tuesday, the 3rd inst., the Medical Officer reported the deaths of two little girls, which he stated to be strictly traceable to over-pressure of work. It appears, to observe, 'both these little girls were the pride of their mothers, and their great aptitude for grasping the subjects taught, and their rest for the brain was not sought until too late.' It came to the conclusion that they could take no action in because it was not one which would come within their jurisdiction as a sanitary authority; but regret was expressed, if the well founded, that the facts were not reported to the Council at the time, so that there might have been an inquiry.

At a meeting of the Old Monkland, Lanarkshire, Local Board, on the 5th inst., a communication was read from the Local Board, enclosing, for the information of the Parish, a copy of a letter addressed to the Clerk of the Old Monkland Sanitary Authority on the complicated question of medical officers of the parish. The letter is dated Feb. 20, and states that the Local Board or officers is or are at once appointed in terms of the Health Act, the Board of Supervision will take prompt action to compel the Local Authority to comply with the requirements of the Act as directed in their letter of Oct. 27 last.

At a meeting of the Public Health Act, relating to the making of houses let in lodgings, to be in force within the Urban Sanitary District, Lancashire.

At a meeting of the Hamshaw Local Board and Urban Sanitary Authority, at meeting, upon the recommendation of the Finance Committee, the salary of Mr. Gilbert Houghton, the Clerk, was increased, to enable him to have the assistance of an additional clerk, upon condition that he (Mr. Houghton) gives his personal services at the offices, up to ten o'clock every morning in the day, as a decision was arrived at after a long discussion; and all the members who were present, with one exception, voted for it; and immediately gave notice that he would, at the next meeting, move the resolution be rescinded.

The Nelson, Lancashire, Local Board and Urban Sanitary Authority have increased the salary of Mr. William Dent, the Surveyor and Inspector of Nuisances, from £150 to £200 per annum.

At a statutory meeting of the owners and ratepayers of so much of the parish of Eglwysilan, in the county of Glamorgan, as is comprised in the rural sanitary district of the Pontypridd Poor Law Union, held at the schoolroom, Groes Wen, on the 26th ultimo, the following resolution was passed:—'That it is expedient that so much of the parish of Eglwysilan as is comprised in the Pontypridd rural sanitary district should be constituted a Local Government district.'

APPOINTMENTS.

MEDICAL OFFICERS OF HEALTH.

ADAMS, Matthew Algernon, F.R.C.S. Eng., L.S.A. Lond., F.C.S., has been re-appointed Medical Officer of Health for the Maidstone Urban Sanitary District, at £200 per annum, for five years.

ALLEN, Josiah, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the No. 1 Division of the Belper Rural Sanitary District, Derbyshire, at £125 for one year.

BILLIARD, Richard Atherstone, L.R.C.P. Lond., M.R.C.S. Eng., has been re-appointed Medical Officer of Health for the Kingston Urban Sanitary District, Herefordshire, for one year from Lady-day.

BLACK, George, M.B., C.M. Univ. Edin., has been re-appointed Medical Officer of Health for the Keswick Urban Sanitary District, at £25 for one year.

BUCHANAN, Peter, M.B., C.M. Univ. Glasg., has been appointed Medical Officer of Health for the Coleford Urban Sanitary District, Gloucestershire, at £20 for one year.

CARP, Joseph Thomas, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Totnes Rural Sanitary District, at £100 for one year.

CHAPMAN, James, L.F.P.S. Glasg., and L.M., L.S.A. Lond., S.S. Cert. R.C.P. Edin., has been appointed Medical Officer of Health for the Hursley Rural Sanitary District, at £25 per annum (in addition to £120 per annum and fees as Medical Officer and Public Vaccinator for the Hursley District and the Workhouse of the Hursley Union), *vice* Selwood, deceased.

CLEGG, Walter, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Boston Rural Sanitary District, at £185 per annum, for three years.

DAKEYNNE, Thomas Edward, L.R.C.P. Edin., and L.M., M.R.C.S. Eng., has been re-appointed Medical Officer of Health for the Leek Rural Sanitary District, Staffordshire, at £80 for the year ending March 25.

DAVIES, Daniel Rees, M.B., C.M. Univ. Edin., L.R.C.P. Edin., L.R.C.S. Edin., and L.M., has been appointed Medical Officer of Health for the Aberystwith Urban Sanitary District, at £50 for one year, *vice* Jones, whose appointment has expired.

DAVIES, Edward, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Northern Division of the Wrexham Rural Sanitary District, at £60 for one year.

GAYLOR, Edward, L.R.C.P. Edin., and L.M., L.F.P.S. Glasg., has been re-appointed Medical Officer of Health for the No. 2 Division of the Belper Rural Sanitary District, at £125 for one year.

HARKER, John, M.D. Heidelb., L.R.C.P. Edin., has been re-appointed Medical Officer of Health for the Lancaster Port Sanitary District, for the year ending March 25, 1886; no fixed salary, payment according to services rendered.

JONES, William, L.R.C.P. Lond., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Southern Division of the Wrexham Rural Sanitary District at £60 for one year.

JOY, Frederick William, L.R.C.P. Edin., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Thetford Urban Sanitary District, at £20 for one year.

LAMB, William, M.D. Univ. Edin., has been appointed Medical Officer of Health for the Arnold Urban Sanitary District, Nottinghamshire, at £20 for one year, *vice* McMillan, resigned.

LANGDON, Thomas Charles, F.R.C.S. Eng., and L.M., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Winchester Urban Sanitary District, at £100 per annum, for three years.

MEAD, George Owen, F.R.C.P. Edin., has been re-appointed Medical Officer of Health for the Newmarket Urban Sanitary District, at £25 for one year.

PROSSER, Thomas Gilbert, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Monmouth Urban Sanitary District, at £25 for one year, *vice* Mayou, whose appointment will expire on the 25th inst.

VERTUE, Francis Henry, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Southwold Urban Sanitary District, Suffolk, at £10 for one year.

WHITE, Sinclair, M.D., F.R.C.S. Eng., has been appointed Medical Officer of Health for the Sheffield Urban Sanitary District, at £500 per annum, *vice* Whitgreave.

WOOD, William Dyson, L.R.C.P. Edin., L.R.C.S. Edin., L.S.A. Lond., has been re-appointed Medical Officer of Health for the combined Bicester, Chipping-Norton, Henley, Thame, Witney, and Woodstock Rural Sanitary Districts, and Bicester, Chipping-Norton, Henley, Thame, Wheatley, and Witney Urban Sanitary Districts, in the county of Oxford, at £616 per annum, for three years.

SURVEYORS, CLERKS TO GUARDIANS, INSPECTORS OF
NUISANCES, &c.

- ALLRN, Mr. C., has been re-appointed Inspector of Nuisances for the Leek Rural Sanitary District, Staffordshire, at £80 for one year, ending March 25.
- AVLESBURY, Mr. Councillor, has been elected a Member of the Dorchester Port Sanitary Authority, *vice* Snook, deceased.
- BARRAS, Mr. George Thomas, Solicitor (son of the late Clerk who held the appointment for forty-one years), has been appointed Clerk to the Rotherham Guardians and Rural Sanitary Authority, at £150 per annum as Clerk to the Guardians, and such further salaries as Clerk to the Rural Sanitary Authority, the Assessment Committee, and the School Attendance Committee, as may be annually fixed, and fees as Returning Officer.
- BEAUMONT, Mr. Herbert, has been appointed Clerk to the Wakefield Guardians and Rural Sanitary Authority, at £150 per annum as Clerk to the Guardians, £80 per annum as Clerk to the Rural Sanitary Authority, such amount as may be fixed annually, usually £50, as Clerk to the Assessment Committee, £10 per annum as Clerk to the School Attendance Committee, and fees as Superintendent Registrar of Births, &c., and Returning Officer, *vice* Wilson, deceased.
- BIRD, Mr. O., has been re-appointed Clerk to the Newhaven Local Board and Urban Sanitary Authority, for three months, from April 7.
- BOURNE, Mr. John, has been appointed Surveyor and Inspector of Nuisances to the Shepton Mallet Local Board and Urban Sanitary Authority, at £100 per annum, *vice* Hardisty, resigned.
- BOVEY, Mr. John, has been re-appointed an Inspector of Nuisances for the Totnes Rural Sanitary District, at £35 for one year.
- BRIDGEWATER, Mr. Basil Bently, has been re-appointed Inspector of Nuisances for the Hereford Urban Sanitary District, at £80 for the year ending March 25.
- BUCKLEY, Mr. J. A., has been elected Chairman of the Hampton Wick Local Board and Urban Sanitary Authority, and a Member of the Lower Thames Valley Main Sewerage Board, *vice* Sir Thomas J. Nelson, deceased.
- BURBURY, Mr. J. H., has been elected a Member of the Kenilworth Local Board and Urban Sanitary Authority, *vice* Robbins, resigned.
- COMPTON, Mr. Thomas Morant, has been re-appointed Inspector of Nuisances for the Carlisle Urban Sanitary District, at £125 for one year.
- DOODY, Mr. C., has been elected a Member of the Nantwich Local Board and Urban Sanitary Authority, *vice* Jackson, resigned.
- DURRANT, Mr. W., has been re-appointed Inspector of Nuisances for the Chertsey Rural Sanitary District, at £200 per annum, for three years.
- EDDOWES, Mr. William Chapple, has been appointed Surveyor to the Shrewsbury Town Council and Urban Sanitary Authority, at £300 per annum, *vice* Butler, resigned.
- GAMON, Mr. William, has been re-appointed Inspector of Nuisances for the Winchester Urban Sanitary District, at £100 per annum, for three years.
- GOULD, Mr. R. D., whose duties as Surveyor to the Town Council and Urban Sanitary Authority of Barnstable will cease from March 25, has been appointed Consulting Surveyor, at £100 per annum.
- GRIMLEY, Mr. Samuel S., the Assistant Surveyor, has been appointed Surveyor to the Hendon Local Board and Urban Sanitary Authority, at £150 per annum, *vice* Pollard, whose appointment has expired.
- GRINSHAW, Mr. Richard, Inspector of Nuisances for the Rishton Urban Sanitary District, has been appointed Inspector under the Sale of Food and Drugs Act.
- HANKIN, Mr. Joseph John, has been appointed an Inspector of Nuisances for the Preston Urban Sanitary District, at 30s. per week.
- HARRIS, Mr. John, has been re-appointed Inspector of Nuisances for the Newnham Urban Sanitary District, at £10 for one year.
- HARPUR, Mr. S., who resigns as Surveyor to the Merthyr Tydvil Local Board and Urban Sanitary Authority in June, has been appointed Consulting Engineer, at £150 per annum, with expenses and the use of a horse.
- HEPWORTH, Mr. George, has been appointed Surveyor to the Brighouse Local Board and Urban Sanitary Authority, for one year, *vice* Rogerson, whose appointment has expired.
- LEES, William Hewson, A.R.C.S.B.A., has been appointed Surveyor under the Metropolitan Building Act 1855, for the South East Deptford District, *vice* Whichcord, deceased.
- LUCAS, Mr. Radnor, Branch Manager of the Wilts and Dorset Banking Company, has been appointed Treasurer to the Town Council and Urban Sanitary Authority of Chard, *vice* Farmer, resigned from ill-health.
- MATTHEWS, Mr. Henry, has been re-appointed Inspector of Nuisances for the Martley Rural Sanitary District, at £100 per annum from year to year.
- MILNER, Mr. William, has been appointed an Inspector of Nuisances for the Preston Urban Sanitary District, at 30s. per week.
- MUNDAY, Mr. R. White, has been re-appointed Surveyor to the Buckingham Town Council and Urban Sanitary Authority, at £50 per annum.
- OSBORNE, Mr. James, has been elected a Member of the Ashborne Local Board and Urban Sanitary Authority, *vice* Cooper, deceased.
- PAUL, Mr. A. D., Bank Manager, has been appointed Treasurer to the Chard Guardians and Rural Sanitary Authority, *vice* Weaver, resigned from ill-health.
- SANDELL, Mr. Henry, Bank Manager, has been appointed Treasurer to the Devizes Guardians and Rural Sanitary Authority, and to the Devizes Town Council and Urban Sanitary Authority, *Locke*, deceased.
- SHELDON, Mr. John, has been re-appointed Surveyor to the Eaton Local Board and Urban Sanitary Authority, at the rate of £90 per annum, for three months.
- SMITH, Mr. Claudius, has been appointed Inspector of Nuisances to the Kingston Urban Sanitary District, Herefordshire, at £100 per annum, *vice* Wislade, resigned.
- SMITH, Mr. Isaac, has been re-appointed Inspector of Nuisances to the Lancaster Port Sanitary District, at £10 for the year ending March 25, 1886.
- STEPHENSON, Mr. John, has been re-appointed Inspector of Nuisances for the Boston Rural Sanitary District, at £156 per annum, for three years.
- SUGDEN, Mr. John, has been elected a Member of the Local Board and Urban Sanitary Authority, *vice* Sugden, his father, deceased.
- THOMPSON, Mr. Joseph, has been appointed an Assistant Inspector of Nuisances for the Halifax Urban Sanitary District.
- TOLLIT, Mr. W. F., has been appointed an Inspector of Nuisances for the Totnes Rural Sanitary District, at £35 for one year, *vice* Watson, deceased.
- TROUNSON, Mr. J. C., has been appointed Assistant Surveyor to the Town Council and Urban Sanitary Authority of Plymouth, at £140 per annum, *vice* Buchan.
- TRUBSHAW, Mr. J., has been elected a Member of the Local Board and Urban Sanitary Authority, *vice* resigned.
- WALLIS, Mr. Thomas Wilkinson, has been appointed Surveyor to the Town Council and Urban Sanitary Authority of Loughborough, at £100 per annum, *vice* Marsden, resigned.
- WARD, Mr. William, has been appointed Surveyor and Inspector of Nuisances to the Town Council and Urban Sanitary Authority of Honiton, at £50 per annum, *vice* Plucknett, deceased.
- WHIBLEY, Mr. George H., has been appointed Collector to the Town Council and Urban Sanitary Authority of Macclesfield, at 8d. per cent. commission, *vice* Oakley, deceased.
- WOOD, Mr. Frederick, Bank Manager, has been appointed to the Tiverton Guardians and Rural Sanitary Authority, *vice* Dunsford, resigned.

PUBLIC ANALYSTS.

- JONES, Mr. E. W. T., has been re-appointed Public Analyst to the Borough of Wolverhampton, for one year.
- STOKES, Mr. Alfred Walker, has been appointed Public Analyst to the parish of St. Luke, Middlesex, at £50 per annum, *vice* resigned.

VACANCIES.

- MEDICAL OFFICER OF HEALTH for the Parish of St. Luke, City of London. Application to G. W. Frost, Clerk, City Road.
- MEDICAL OFFICER OF HEALTH for the Lewisham District. Application, 23rd inst., to H. S. Winnett, Clerk to the Board of Works.
- MEDICAL OFFICER OF HEALTH for the Giltcross Rural Sanitary District: £45 per annum. Application, 28th inst., to Clowes, Clerk to the Authority, New Buckenham, Ant.
- MEDICAL OFFICER OF HEALTH for the Llandysilio Urban Sanitary District. Application to Thomas Hughes, Clerk.
- TOWN CLERK AND CLERK TO URBAN SANITARY AUTHORITY for the Wigan Sanitary Authority: £700 per annum and costs out of office. Application, 23rd instant, to M. W. Peck, Clerk.
- TREASURER to the Bridlington Guardians and Rural Sanitary Authority. Application to C. Gray, Clerk.
- CLERK to the Houghton-le-Spring Guardians and Rural Sanitary Authority, Co. Durham.
- CLERK to the Sculcoates Guardians and Rural Sanitary Authority, Yorkshire.
- ENGINEER AND SURVEYOR to the Merthyr Tydvil Local Board and Urban Sanitary Authority: £350 per annum, with the use of a book-keeper and the use of a horse. Application, 23rd inst., to Thomas Williams, Clerk.
- SURVEYOR to the Town Council and Urban Sanitary Authority of Norwich. Application to the Town Clerk.
- SURVEYOR to the Bradstair Local Board and Urban Sanitary Authority. Application to the Clerk.
- SURVEYOR to the Worktop Local Board and Urban Sanitary Authority: £120 to £150 per annum, with an office. Application, 23rd inst., to John Appieton, Clerk.
- SURVEYOR to the Matlock Local Board and Urban Sanitary Authority. Application 21st inst., stating salary not to exceed £100 per annum, to J. W. Skidmore, Clerk.
- SURVEYOR to the Frome Local Board and Urban Sanitary Authority. Application to G. W. Bradbury, Clerk.
- SURVEYOR, INSPECTOR OF NUISANCES, AND COLLECTOR to the Hucknall-Huthwaite Local Board and Urban Sanitary Authority. Application to G. H. Hibbert, Clerk, 56 Westgate, M.
- ASSISTANT SURVEYOR to the Hendon Local Board and Urban Sanitary Authority. Application to Samuel Tilley, Clerk.
- ASSISTANT INSPECTOR OF NUISANCES for the Malling Rural Sanitary District. Application, 21st inst., to Henry Clerk to the Authority, West Malling.
- COLLECTOR to the Town Council and Urban Sanitary Authority of Louth. Application to T. F. Allison, Town Clerk.

ORIGINAL PAPERS.

DISINFECTANTS AND THEIR
SANITARY USES.*

BY W. TRIPE, M.D., M.R.C.P.E., F.R.
Med.Soc.

Medical Officer of Health for the Hackney District.

Ordinary Member of the Sanitary Inspectors' Association.)

One of the methods of preventing the spread of contagious diseases is of very ancient date. An extended code of instructions for the prevention of leprosy is given in the 13th chapter of the Bible. It is also evident from the completeness of the directions that the processes were then carried out for the first time, and that they were probably practised by the Egyptians long before the time of Moses. The directions given are that the priest should first view the patient, and if he was found to be leprosy, the sick should be removed from, and not come within a certain distance of, the healthy; that every infected thing should be burnt; whilst animal charcoal, sprinkling with soap, and water should be plentifully used. If persons appeared to be infected they were to be removed, and, wiser than our present legislators, the infected were to be carried to a place set apart for unclean things. Contrast this with the way in which builders of the present day get rid of the refuse from, or the scrapings of walls of rooms occupied by small-pox and other persons suffering from infectious disease. The dustbin often contains the scrapings and other rubbish, so that if persons have not been sufficiently disinfected, will probably be spread. We also find from Homer in the Odyssey that fire and sulphur fumes were used for disinfecting apartments, even when they had been infected only by the blood of slaughter.

A paper on Filth, written by Mr. Simon, then Secretary to Her Majesty's Privy Council, appeared in the Supplementary Report for 1884, in which he stated that 'uncleanliness must be reckoned the deadliest of our present removable causes of disease,' that it is amongst the oldest and most common of medical experiences that populations perished from filth, and within direct reach of its influence succumb to various diseases which are, under favourable conditions, absolutely unknown. It is therefore desirable that we should have some appreciation of the way in which filth is so destructive. Mr. Simon proceeded to express his opinion that the hurtfulness of filth depends not on its offensiveness, but on the presence of noxious ferments, which are not only gaseous in their essence, or an inseparable part of it, but in solid elements which the microscope discloses. These living bodies, in their largest as well as in their very minute microscopical objects, and in the smallest sizes are probably unseen even with the microscope; organisms which in virtue of their power are indefinitely self-multiplying within their spheres of operation, and which, therefore, form a complete contrast with chemical poisons; and which can develop indefinitely large ulterior effects from doses which are indefinitely small. He

divides contagia into two classes, viz. (1) those of which man's body is the sole birthplace, and which we see in case after case multiplying their respective types with a successivity as definite and identical as that of the highest order of animal and vegetable life, so that a case arising independently of a previous like case, such as small-pox or syphilis, is hitherto practically unknown; (2) those which confess a birthplace, exterior to man, a birthplace amid the controllable conditions in the physical nature which is around us, and amongst the common putrefactive changes of dead organic matter.

Having thus narrowed the limits within which disinfectants can usefully work, we must first consider their relations to the poisons given off from the kidneys, bowels, skin, and lungs. As regards the latter I shall say but little now, but shall refer to their relation under the heading of 'aerial disinfectants,' and then only briefly, as they scarcely come under the supervision of inspectors of nuisances. I may, however, mention that a strong solution of sulphate of iron, with a proportion, about 1 in 200, of No. 4 or 5 carbolic acid, in proportion to the mass to be disinfected, forms a satisfactory disinfectant for the stools and urine of patients affected with small-pox, scarlet fever, typhoid fever, &c. It is necessary, if disinfectants are to do their work properly, that they should be used with a definite object, as they only work within certain narrow limits, and must be employed in such a way as to be precisely adjusted to their work. Thus numerous experiments, to which I shall refer when briefly discussing individual disinfectants, show that although the time for which infected articles are exposed to the action of disinfectants has a material bearing on the result, yet that there is a certain limit of strength which the disinfecting agent must have in relation to the article to be disinfected, for if too weak, or used for too short a time, the contagion will not be destroyed. Experience has shown the manner in which disinfectants can generally be satisfactorily used in order to kill either by heat or chemical action any given contagion, but that if set to work in indefinite spaces, and in indefinite quantities, they cannot produce satisfactory practical results. A consideration of the action of disinfectants on infective matter contained in the living body forms no part of the duty of inspectors, but should be carefully studied by physicians to ascertain if there are any agents which will destroy the infective living organisms whilst in the body, or which may prevent the spread of infectious diseases from infected persons to others who are necessarily brought into their presence. We may be encouraged in this search by the effect of quinine on the paroxysms and general progress of ague, which this drug has generally the power of first checking and then curing. This, however, will depend on its being a fact that this disease is caused by a bacillus, and that quinine is destructive to these bacilli. The experiments of Dr. Klein with chlorine, to be discussed hereafter, are, if found to be generally applicable to human beings, a great step in advance as regards the prevention and the spread of disease from infected persons. On this point Dr. Sanderson is of opinion that the knowledge which as yet exists on the action of contagia, and particularly of what constitutes the specific differences between them, is as yet so incomplete that it is impossible to say whether the discovery of specific colytics is likely to be realised or not, but that the time seems to

* Read at the meeting of the Sanitary Inspectors' Association on 18th May 1885.

have now arrived for initiating researches in this direction.

There is one difficulty in connection with the action of disinfectants on specific infective matter—viz., the presence or absence of spores in the materials operated upon. In some specimens of bacteria examined, the spore stage of growth appears to have passed by, so that a lower temperature, a smaller quantity, and a less potency of a disinfectant will then suffice. As regards small-pox, &c., there is no certain evidence of the presence of specific living organisms, and, therefore, the first point appears to be to procure evidence of their existence. At present we reason from analogy—*i.e.* we infer from the symptoms occurring in a case of small-pox that they are caused by the entrance into the blood of a specific infection. The quantity necessary for infection is most probably very minute, as in the case of specific septicæmia, a one-millionth part of a drop of infected blood was sufficient to destroy the life of a young rabbit with symptoms of septicæmic poisoning. It was also found that by heating the blood to 212° F. for six hours, and then to 250° for one hour, the infectiousness of the blood in this instance disappeared.

The word disinfectant is ordinarily used in a most extended sense, being applied to agents which remove offensive smells, or check putrefactive action, as well as to other chemical agents that act as germicides, with or without being deodorants or antiseptics. Strictly speaking, it is a substance capable, when used in proper quantity and under suitable conditions, of taking away the power from an infected article or animal, of setting up in a healthy animal, including man, an analogous disease to that from which the sick suffered. This may be done by the direct action of the disinfectant in destroying the specific contagion or by arresting or preventing its action in the body. The former class of disinfectants are germicides, the latter mostly antiseptics. In addition to these there are the oxydising agents, which are for the most part germicides, when used of a sufficient strength.

The dose of infectious matter necessary to spread the disease is very doubtful, but, judging from the amount required for a successful vaccination, the quantity for small-pox is larger than for septic diseases. I have already mentioned that a millionth part of a drop of blood containing a septic poison, when introduced into the blood of a rabbit, was sufficient to cause death in a little more than twenty-four hours, and that the blood of the animal that died was swarming with bacteria. The minute dose of zymotic poisons which will destroy life shows the excessive care that should be used in disinfecting all the excreta, the clothing and bedding of patients, and, where possible, the air expired from the lungs and the vapours given off by the skin of the patient. This latter is, however, a medical question. In fumigating a room with sulphur, the chimney should be blocked up, paper be pasted all around the window sashes, the opening around the doors properly closed, and all other openings properly pasted over with brown paper. All the personal belongings used by the patient and in his room, such as bedding, bed-clothes, carpets, &c., should be either baked or burnt. It must also be remembered that there is very good evidence to show that during epidemics the virus has greater intensity than at non-epidemic periods, and that, therefore, extra care, if possible, should be used in disinfection. The question as to

the utility of anointing the bodies of the sick with carbolic and other soaps, or with medicated oil, does not fall within the province of this paper.

Disinfectants are so numerous that I do not propose discussing any but those that are most frequently employed, or which are efficient and capable of being safely used by the public. They may be conveniently grouped into (1) desiccating agents, (2) oxidising agents, (3) germicides, and (4) antiseptics. In the first, the most important is dry heat and heated steam; amongst the second, permanganate of potash and manganate of soda, sanitas oil, and other bodies said to evolve peroxide of hydrogen, whilst in the third class are comprehensive agents, such as mercuric sublimate, chloride of zinc (Burnett's), arsenic, nitric, sulphuric, and hydrochloric acids, and some chlorides, sulphurous acid, and most nitrites, glacial acetic acid and some similar chemical agents. As to antiseptics, there are numerous, and include alum, chloral hydrate, monochloral salt, salts of iron, copper, &c., carbolic acid, both pure and impure, and some other tannins. Many of these disinfectants act not only as germicides when used of great strength, but also as antiseptics, and the same remark applies to oxidising agents, so that it must not be supposed that the above-named have only the specific action of the class in which they are grouped. I do not propose discussing the comparative value of all these bodies.

In selecting a disinfectant for general use, we must consider its efficiency in comparison with their disinfecting power, and freedom from poisonous qualities seen in leading indications; unfortunately, however, many of those which are cheap and non-poisonous are as chloral and alum, are not sufficiently active for general use, whilst sulphate or perchloride of iron are objectionable because they stain line woollen goods, and should therefore be avoided. The same objection applies to Condy's blue when used of sufficient strength to act as a disinfectant, and the expense of the fluid is also a drawback to its general use. Carbolic acid in liquid form is a comparatively cheap and efficient disinfectant, but those from which tar and other acids have been removed, except for use in the bath, should alone be used, as it is useless for cheaper sorts, unless with the addition of some similar base to render them soluble. Glacial acetic acid, in the form of aromatic vinegar, has been employed for a very long time, and was in the olden time by physicians when attending cases of gaol fever, plague, &c. It was also to have been carried by thieves and others pillaging the houses and bodies of those who died from the plague. Bunches of sweet-smelling flowers and of flowers were placed in front of the cells when trying prisoners brought from the Old Bailey in times when gaol fever prevailed. These aromatic essential oils containing peroxide of hydrogen, and are therefore of some use in sick rooms. Carbolic acid, either in the liquid state or in the form of a solid, is also very useful, but requires discretion in its use.

I shall now proceed to discuss the indications for disinfectants, considering, in the first place, the use of disinfectants and heat.

Aerial Disinfectants.—The two disinfectants chiefly employed are chlorine and sulphurous acid gas. In addition, however, carbolic acid, sanitas oil, terebene, solution of chloride of

ly's fluid are sometimes diffused through the sick chamber by means of a vaporiser, are more commonly used by sprinkling the mat on a sheet fastened to the door frame, admit of persons passing in and out of the room. They are also often sprinkled about the room, and even the house generally, or are in saucers. As I have just mentioned, they are of little service. If, however, they are used while the patient is in the room, of such use as might injure the patient, it becomes a question if they should be used at all, but some experiments by Dr. Klein (published in the supplementary thirteenth Annual Report to the Local Sanitary Board) afford some hope that by judicious management the risk of infection may be avoided by their use. Certainly the offensive sick rooms occupied by patients having scarlet fever, typhoid, and some other fevers, may be purified by the vaporisation of Condy's fluid, in solution, and other oxydising bodies, if a proper vaporiser be used. Dr. Klein has made a number of experiments upon swine of 'swine plague,' which is highly infectious, and causes death in swine. He first tried the use of phenilacetic and phenilpropionic acids in the juice of a diseased lung, and found that a solution containing 1 of the acid to 800 of blood, rendered the juice innocuous in twenty minutes after its mixture. He had also shown, in a former report (1877-78), that the infection spreads from a diseased to a living animal placed in the same stable, even when the two animals were separated by considerable space. On Nov. 6, 1883, a pig was placed in a stable, 18 feet long, and infected with the disease. On the 13th the pig was very ill with pneumonia of both lungs. On the 14th the stable was fumigated with chlorine gas, so that the air in it became pungent. A healthy pig No. 2, was placed in it, and allowed to remain for 24 hours with the door closed, and at the expiration of that time the stable was again fumigated sufficiently to make the air well pungent, the pig was allowed to remain three hours longer, and was taken away. The same process was repeated every day until the 18th, when pig No. 1 died, but pig No. 2 remained quite healthy. A similar set of experiments were made on Nov. 23 to 28 with pigs Nos. 3 and 4, when pig No. 4 showed symptoms of the disease on the 24th, but was found, however, on close inquiry, that the attendant had neglected the second fumigation on the 26th, so that when pig No. 4 was removed from the stable the smell of chlorine was very faint. In the third series of experiments it was found that healthy pigs were put into a stable imperfectly fumigated, and they took the disease. Dr. Klein, therefore, put two diseased pigs in separate stables (a and b) and after a few days had them removed to a new stable. Stables a and b were well fumigated with chlorine for six hours, and into each of which was placed a healthy pig, and kept there for several days during which time they remained well. After a few days they were inoculated with swine plague, and showed symptoms of the disease after two or three days' incubation. Pig No. 4, which was suffering from the disease at the time of its removal to the new stable, died in due course. This is a very important experiment, especially if the results should be obtained hereafter, since the experiments by the same experimenter have

shown that chlorine is not so powerful a germicide as sulphurous acid gas, which, I believe, is now used almost to the exclusion of everything else, as an aerial disinfectant. In Hackney for many years past the infected rooms and articles therein are disinfected with sulphur before any of the contents are removed to the disinfecting hot-air apparatus, 1 lb. of sulphur being used to each 1,000 cubic feet of air in the room. This has been done with most satisfactory results; as, except in cases where the disease has occurred again in less than fourteen or fifteen days, there has scarcely been an instance of recurrence, at any rate within three or four months. I am not aware of any case in which another family has come to live in the room or rooms when vacated, and the disease has broken out again, except where it has been shown that they came from an infected house.

The use of aerial disinfectants as usually carried out by sprinkling floors, articles of clothing, &c., with a disinfecting fluid, or of wetting sheets to allow of evaporation, is worse than useless, as it is apt to engender a false confidence in those who use them. Of course, after the experience of Dr. Klein, I am not prepared to say that they cannot be employed so as to prevent the infection of nurses, visitors, and others, if the chlorine or sulphur be used in a sufficient quantity to make the air almost irrespirable. It seems to me too great a risk to expose a patient and visitors to these gases of sufficient strength and for the time requisite to render the infectious matter inert, especially as regards small-pox, when they can protect themselves in another way, viz., by vaccination or revaccination. If Dr. Klein's experiments can be successfully carried out by others, the plan might be useful in preventing the infection of persons outside the sick room, by forcing the air through solutions of these gases, instead of into or rather through a furnace.

Heat.—The most certain and useful disinfecting agent is dry heat. This is applied in several ways, the operation being generally carried out in what may be termed large ovens, heated either by coal or gas. But as superheated steam is to all intents a dry heat, because the slight moistening of the articles steamed soon goes off after the door of the apparatus is opened, the disinfectors worked by it may be looked upon as ovens. Numerous experiments have been carefully made on the temperature at which certain matter capable of conveying infection becomes sterilised. The apparatus in use at Hackney is Fraser's, which has been in satisfactory operation there since 1871, but it has this objection, that the heat gets up slowly, and is not so readily under control as some others, being heated by coke, and, unless carefully watched, articles placed in it get scorched. There is another apparatus recently introduced by Jennings, which was tested at the Exhibition of 1884, and obtained a silver medal, in which the heat is obtained from gas, the burners being below, and the articles to be disinfected being placed on rods above. It is stated that in little more than half an hour the temperature rose to 262° F. The same, however, may be said of Lyon's disinfectant, which is worked by superheated steam, and, so far as I have seen, is more penetrating and less risky than dry heat. With this apparatus I saw a thermometer placed in a mattress indicate 242° F. in forty minutes. Another machine for disinfecting by dry heat is Ran-

some's, which is worked by gas, and has the great advantage of being provided with a self-acting apparatus for regulating the supply of gas and keeping the contained air at one temperature. The disadvantage of Lyon's machine is that it requires a six horse-power engine for its efficient working, unless steam can be borrowed for the purpose. Some experiments were made some time since by Dr. Henry on vaccine lymph to ascertain the temperature at which it becomes sterile, when it was found that a temperature of 150° F. continued for two hours was sufficient for this purpose, but that 120° continued for three hours did not have a similar effect. In using heat it must be remembered that the same temperature which will sterilise infectious matter, if applied for two hours or more, will not do so if used for half an hour only; so that the temperature of 230° to 240°, which is that employed at Hackney, where the articles are, as a rule, kept in for about three hours, and which rarely scorches, has answered very satisfactorily. Experiments at this temperature have been made on yeast, bacteria, living organisms in sewage, and fungi, with the result of destroying the power of propagating their like. It must, however, be remembered that although bacteria are destroyed at this temperature, the spores, if any be present, will not be deprived of their vitality. Dr. Baxter placed points charged with vaccine lymph into an oven to ascertain the temperature required to render dry lymph sterile. He found that until a temperature of above 176° F. had been reached the lymph remained active, but the time in which it was exposed to the highest temperature noted was not more than thirty minutes, whilst Dr. Henry exposed the lymph in the first set of experiments for four and in the second for two hours. Similar results have been obtained in other experiments.

Some years ago I made numerous experiments conducted on each group of objects for nearly three weeks, and ascertained that the living organisms in sewage, including infusoria, vibrios, bacilli, spirilla, were deprived of motion by a temperature of 140° Fahr. The infusoria, as might have been expected, became motionless at a much lower temperature, viz., 110°; at 125° most of the vibrios, bacilli, and spirilla became motionless, and at 135° nearly all the bacilli ceased to move, and at 140° all were dead. At the end of four days some bacteria were moving about, but as the beakers in which the experiments had been carried out were not covered, they might have been newly introduced from the air. These experiments agree very well with those on vaccine virus, but not at all with the investigations of Mr. Crace Calvert and others. It is doubtful how far we should apply the results of experiments such as these to the infectious matter of zymotic diseases, but the rough proof afforded by disinfection by heat, of infected clothing, bedding, &c., is, I think, sufficiently reliable to justify us in saying that the exposure of infectious matter to a temperature of 240° F. for an hour, after the disinfector has been raised to that temperature, is sufficient to prevent the spread of an infectious disease.

Although the term 'disinfectant' has been used here in its broadest sense, I think it should be confined to germicides, as I stated years since. If I had adopted this restricted meaning, I should have left unnoticed some chemical agents which I am desirous of bringing before your notice, and I shall therefore refer to them in the order previously stated.

Condy's Fluid is a solution of permanganate of potash, and in a very expensive form, when used as prepared for sale. The permanganates are oxydising agents, and manganate of soda has been largely used by the Metropolitan Board of Works, for oxydising the animal matter contained in the sewage poured into the Thames. Condy's Fluid is often used by sprinkling it on a sheet in the sick room, and other disinfectants are often used in the same way. As regards small-pox, and other zymotic diseases, there is but little, if any, use in evaporating Condy's Fluid in a sick room, even by a vaporiser, except for the purpose of removing unpleasant smells by oxydation. As regards small-pox, there is certainly a special reason why it and other aerial disinfectants must be useless, viz., that experiments by Chauveau seem conclusively to prove that the poison is not volatile. Bedside experience also points to the same conclusion. I noticed when experimenting with Condy's Fluid, used in rather large proportions, that it increased the movements of microscopic life in sewage, apparently by setting free oxygen, and it was not until the colour of the fluid ceased to be discharged, on its addition to sewage, that any prejudicial effect on life was perceptible. As regards the influence of permanganate on vaccine lymph, it was shown that one half, 0.5 per cent., of this disinfectant sterilised it, but that a smaller quantity did not. The permanganate itself, and not Condy's Fluid, was used in this experiment.

Carbolic Acid.—Considerable differences occur in the results of experiments according to the kind of acid used. Many of the experimenters have used the pure crystallised acid, but this is not the substance usually employed by local sanitary authorities and their officers. The same remarks that have been made on Condy's Fluid as regards aerial disinfection when a patient is in the room, apply with greater force to carbolic acid, as it is not an oxydising agent, and cannot be safely respired when it is evaporated by a vaporiser to a sufficient extent to prove a disinfectant. Pure carbolic acid is more of an antiseptic than a germicide, but some of the other tar acids contained in the fluid acid, as usually sold, are more potent germicides. I found that 1 per cent. of No. 5 carbolic acid (which is called miscible, although it is so only to a certain extent) would destroy bacterial and infusorial life for a long period, but at the expiration of about twenty-eight days, living bacteria were detected in the solution, apparently through the evaporation of the acid. A solution of $\frac{1}{2}$ per cent. destroyed infusoria, but not bacteria. Dr. Baxter reported some experiments with carbolic acid (pure crystals) in the sixth report to the Privy Council, to the effect that, when less than a 1 per cent. solution of acid with vaccine lymph was used, the mixture remained active, but when mixed with $1\frac{1}{2}$ per cent. its activity was diminished, and with 2 per cent. it ceased to be infective. This is important, as a 2 per cent. admixture of acid is a strength far in excess of that ordinarily used for disinfecting purposes. Mr. Wynter Blyth also carried out a series of experiments with various chemical disinfectants on the spores of the anthrax bacillus, and showed that neither carbolic acid nor any other chemical agent will deprive these spores of their power of germinating in a proper cultivating liquid. The same remarks apply to carbolic acid powder.

The action of chlorine and chloride of zinc is effective when a certain strength is used. These

ter found that when chlorine was added to virus in sufficient quantity to make it acid, was in the proportion of '1633 per cent., the as sterilised. I added chlorine water to but the quantity necessary to make it acid ch in excess of that likely to be ordinarily id but little effect was produced on the . Chloride of zinc in the proportion of one ett's Fluid in 200 of sewage, was sufficient to tion in the various forms of life ; but a solu-chlorinated lime in the same proportion did uduce any decided effect. Hydrochloric ic) acid was also tried, and had, with the hlorides, but very little influence on the ant odour, but it stopped all evidences of life as it was added to the sewage in sufficient es to make it decidedly acid. All these dists, as well as sulphurous acid, are somewhat us to use, especially by uninstructed persons, uld not be distributed to all comers.

axter made a series of experiments on dry lymph with chlorine, sulphurous acid, and our of carbolic acid, when he found that it essary to expose the lymph to the action of rine and carbolic acid vapour for thirty before it was sterilised, but that an exposure minutes to sulphurous acid gas was sufficient purpose, showing that sulphurous acid gas is y the most active aerial disinfectant readily ole with which we are acquainted.

orine, when added to sewage in the propor- t per cent., removed the offensive smell and d the infusoria, but not the bacteria ; but er cent., bacterial motion ceased. The agent advantage of substituting a rather pleasant r the offensive odour of sewage.

ckton is a good disinfectant, but it labours e disadvantage of being dangerous to use, as a quantity of sulphurous acid in solution, ot carefully unstopped in hot weather it ie out of the bottle almost like ginger beer, troy or decolorise the fabrics, clothes, &c., with which it comes in contact. dded in the proportion of 2 per cent. to ewage, it removed the offensive smell and d the bacteria, and no life was discovered in ge acted upon during the twenty-one days 1 it was kept.

alum was by no means satisfactory, as it emoved the offensive smell nor destroyed the hen 2 per cent. was added to sewage, illed the infusoria. It, however, decidedly the putrefactive change when added to a ision of beef.

action of Ditches, Middens, &c.—Although itan sanitary officers have but little to do disinfection of ditches, &c., yet it is of im- for inspectors at large to have some know- the agents most suitable for this purpose. lphate or perchloride of iron is used, a pre- of oxide of iron occurs with decomposition carbonate of ammonia found in ditch- it received the drainage of houses, and tted hydrogen is deposited as sulphide of om 20 to 30 grains of sulphate per gallon e is necessary. Lime is often used, but is fficacious, as the organic matter contained recipitated mechanically, and the offensive n becomes, after a time, worse than before, sulphide of calcium formed from the sul- l hydrogen remains dissolved in the water.

Hillé's process for deodorisation consists of lime, tar, and salts of magnesium, mixed with water, and in suitable cases is very useful. For middens, cess-pools, &c., sulphate of iron in solution, with fluid carbolic acid added, is suitable, or nitrate of lead may be used. Sufficient of this for an ordinary sized cesspool may be made by dissolving 1 lb. of litharge (sugar of lead) in 2 gallons of water, and adding 7 ounces of strong nitric acid, part only of the water being added before the acid. If carbolic acid be used, from 50 to 100 parts of water should be added to each part of acid. If the powder be used, we must remember that it ordinarily varies in strength, but generally consists of about 33 per cent. of carbonate of lime and other chemicals in McDougall's powder, whilst Calvert's contains from 20 to 30 per cent. of fluid acid and alumina. For cesspools, and occasionally for drains, a mixture of 6 lbs. of quicklime and 1 pint of carbolic acid makes an efficacious mixture. These lime powders should not be used to any extent for urinals, as they choke up the pipes rather quickly ; nor too largely and frequently for house-drains, for the same reason. Terebene is a powerful deodorant, as it removes the smell of ammonia and sulphuretted hydrogen, and, if used in full quantities, it substitutes a somewhat pleasant for the unpleasant smell. It consists of terebene, sulphate of copper, or of iron, and sometimes of both, as well as alum and a little bichromate of potash, and is one of the very best disinfectants for house-drains and cesspools. Chloride of lime is objectionable, because the volatile parts escape after a time, and decomposition of the sediment sets in, giving off a most disagreeable smell.

Inspectors of nuisances will be so rarely called upon to report on the best means for disinfecting polluted rivers that I need not go into this question, especially as the means to be adopted will depend upon the refuse poured into them. The same remark also applies, but in a less degree, to sewers, as it is evident that the refuse from sugar factories, paper makers, chemical works, &c., requires different and special treatment. The occasional use of carbolic acid to sewers is of very little use, as the quantity of sewage quickly carries it away ; but if the gullies are trapped, carbolic, sanitas, or terebene powder may be usefully employed, as they deodorise the offensive contents, and prevent matters from arriving at a state of putrefaction before they find their way into sewers. The great use of disinfectants for house-drains is to delay the decomposition of any organic matters that may be detained in them or may coat their interior. The health of the inhabitants of the houses, of the sewer men, and of those who pass over untrapped gullies or ventilating openings, is, for this reason, less injured than it otherwise might be. The same remark applies to scrubbing-brushes, flannels, and other articles in drains which check the flow and cause deposits. The offensive smell from ventilating openings from sewers at the level of the street is believed to be best remedied by animal charcoal being placed in perforated trays or boxes between the openings and the sewers, but I have not noticed any permanent good effect, unless the charcoal is frequently changed and kept dry.

There are many other disinfectants besides those I have cursorily mentioned, which may, under certain circumstances, be usefully employed. I state this as I do not wish it to be considered that I believe all others besides those mentioned are valueless. There

are many of considerable efficacy, including salicylic acid, which are very useful as antiseptics, but they are chiefly used as preservative agents. I also have not considered in detail arsenic, chromic acid, corrosive sublimate, &c., as they are too dangerous and too expensive for ordinary use.

THE SANITARY STATE OF WHITECHAPEL.*

LAST year this country escaped a threatened visitation of the cholera which was so fatally prevalent in the south of Europe. It seems probable that if such immunity is again to be enjoyed, the sanitary authorities and the public generally must not relax in their efforts to unite their forces in watchful and earnest endeavours to improve the sanitary condition of the country.

In June of last year it was found that a large concourse of Russian Jews, hunted out of their native country, had sought shelter and protection near the members of their own faith and station in the neighbourhood of Whitechapel, and much activity was aroused with the object of raising the hygienic standard as high as circumstances would allow. Russia is not the country to teach cleanliness, and persecution is not the atmosphere in which to practise it; hence the Jewish Board of Guardians, mindful of their duty to their neighbours, and anxious that this additional crowding should not add strength to the threatening danger of an epidemic, determined to call their sanitary committee into active service, and to appoint, at their own expense, a special sanitary inspector, to observe and improve the healthy lodgment of the immigrants. The Board seems to have been stimulated to take this step on learning the startling intelligence that in that season of zymotic peril, with this additional burden cast upon the authorities, the staff of the Whitechapel Local Board consisted of no more than two sanitary inspectors told off to regulate the hygienic condition of 7,500 houses. As the newly-appointed sanitary officer had no legal power, his services were offered to the Whitechapel Board, but, having been declined, he was left to exercise over landlords and tenants as much influence as he could command by means of printed notices and personal interviews. The sanitary committee of the Jewish Board report that many of their notices were respected, and thus a certain amount of responsibility and work was taken off the shoulders of the very limited district staff. When, however, attention could not be secured to the many grave sanitary defects which the inspector discovered, he was bound to report them to the local authorities of Whitechapel. The Jewish sanitary committee state that 'out of the total number of 1,747 houses visited, there were no fewer than 1,621 houses in which the water-closets were unprovided with any arrangement for flushing with water, and only 126 in which any such appliances existed.' And in October they addressed to the Whitechapel District Board of Works a letter, calling in these words their 'attention to the fact that in a very large

number of cases of sanitary defects brought to your notice in the months of June, July, and August last, no remedial action has been taken by the owners.' This letter points out a number of typical cases with very grave defects, and, in their opinion, rendered the houses in which they existed as unfit for human habitation, and the examples submitted do not represent the homes of the Jewish poor. The Whitechapel Board, as will be seen later on, mistaking these specimens as the total number, congratulated themselves on its paucity.

The public authorities of the district express in this letter of information and advice a warmth no degree warmer than that proffered to the appointed inspector, and instructed a sub-committee to issue a report which frowns on the apathy of these volunteer fellow-labourers as though they intruded on the preserves of the regular authorities. It says 'that much more good (if the public persisted in) will result in the future when the enthusiasm of the committee of the inquiry has toned down to something more reasonable.' Although this committee has been in existence for more than a quarter of a century, and has, on the occasion of the appearance of every epidemic, set itself to work erecting stand-pipes, yet it evidently in the opinion of the Jewish committee were far from having attained that goal at the time they issued their letter. The committee have perused the communication with regret, because, with the exception of a compliment paid to the medical officer and his assistants, it is a continuous outpour of complaint and complaint . . . and your committee is clearly of opinion that it is the habits of the people more than the condition of the structural defects of the houses that have misled the agents of the guardians in framing their reports.' Then, passing by the necessity for water supply, thus to contest the superiority of one system as compared with another, it appears that, on the question of water closets, the Jewish guardians were, from the first, impressed with the importance of a water apparatus being provided to every house. The system has, of course, very great merit under the circumstances; but Dr. Liddle, the late Medical Officer of Health, long since discarded it as unfitted to the habits of the people in the poorer portions of the district, and the system of the water-taker being appointed to flush the closets was substituted.

And, in conclusion, whilst refuting the charges of the Jewish Board, they 'point to the fact that the rates of mortality in the district were for the quarters ending September last respectively 18.9, 21.9, and 24.3 per 1,000. The last rate was raised in consequence of the deaths amongst infants from diarrhoea.' The Medical Officer of Health, states in his report for 1884 'that in the third quarter of the year there were increased deaths from infantile diarrhoea in the district at considerable disadvantage compared with some other districts. I stated in my report for the last quarter that such deaths belonged to the class of zymotic diseases, because it is usually caused by the administration to infants of food which they are unable to assimilate. It is so every medical man could bring abundance to demonstrate. The simple wit-

* Report of the Sanitary Condition of the Whitechapel District for the Quarter ended Jan. 3, 1885; also for the Year 1884. By Joseph Loane, Medical Officer of Health. Board of Guardians for the Relief of the Jewish Poor Twenty-sixth Annual Report, from Jan. 1, 1884, to Dec. 31, 1884.

such foods from the diet of an infant apparently dying from diarrhoea, and the substitution of a diet more closely allied to its natural food, frequently produces almost miraculous results.' True, unsuitable food is a point of the highest consideration, and such diet is more fatal in summer than winter, but so is an insanitary atmosphere, and unwholesome food is not consumed only in the third quarter. Diarrhoea does not attack infants only who are fed with unwholesome food, nor is it exclusively the disease of infancy, although the very young and the very old are its chief victims. It is found mapping out in hot and damp seasons the several areas where foul conditions and poverty are most rife, so that the prevalence of diarrhoea—even though it be infantile diarrhoea—may be taken as measuring the degree of virulence which surrounds a badly drained, badly ventilated, and unhealthy region. In reference to the population of the Whitechapel district, Dr. Loane reports that it consisted chiefly of poor from the south of Ireland, 'but now by far the greater proportion comprises Russian and Polish Jews; and so rapidly have the latter poured into the district within the last few years that (according to the Registrar-General's Report for 1881) I find that in a total population of 71,363 persons there are no fewer than 9,660 foreigners,' of whom 5,293—most of them driven from Russia—belong to 'that wretchedly filthy class known generally as "Polish Jews."'

The report continues:—'Those who have any experience of the poor people to whom I allude . . . will know how much anxiety and work are necessary to enforce habits amongst them which, although natural to more civilised people, are not understood by the class to which I allude. It was no doubt the result of this undue proportion of foreigners to our inhabitants in the district that originated a letter to your Board from the sanitary committee of the Jewish Board of Guardians.' This letter and the Board's reply are both published in the medical officer's report; but the rejoinder from the Jewish Board is omitted, because the doctor states he considers 'the results of your sub-committee's inspections and meetings adopted by the Committee of Works, and also by your Board, remain unaffected.' Now this 'rejoinder,' which appears in the annual report of the Board of Guardians for the Relief of the Jewish Poor for the year 5645 (1884), seems to us to be a most important document, including the whole question, and reviewing its bearings most judiciously. We learn from it that, however useful the Russian immigrants might be in the manipulation of sanitary machinery, and however ready to flush it with abundance of water, yet either the water nor the machinery is available, for the authorities—whilst stigmatising their filthy habits—have refused them both. Hence all who dwell under such regulations must, whether voluntarily or otherwise, be 'a wretchedly dirty class.' In support of our opinion we quote some extracts from the rejoinder above referred to:—

Board of Guardians for the Relief of the Jewish Poor.

It is a source of satisfaction to my committee that your Board in its report practically admits most of the facts stated in our communication of Oct. 30 last. No denial is given to the statements as to the filthy and unsanitary condition of the back-yards, the absent or defective traps, the absent or uncovered

dustbins, and the general non-compliance with the Regulations framed by your own Board under the provisions of the Sanitary Act, 1866. Nor does your report challenge the accuracy of our statements as to underground rooms improperly and illegally inhabited. Nor does it deny any of our statements as to noxious emanations from sewers, nor as to noisome and offensive trades suffered to exist in your district, except to throw doubt on our verbal accuracy in one of the instances cited, and to intimate that in one other instance the nuisance had, since the date of our inspection, been abated.

The chief facts being thus admitted, we therefore indulge the hope that the frank declaration of your report that 'much remains to be done' implies that your Board is resolved that much shall be done to remedy those crying sanitary defects which are so detrimental to the health of the district.

There being but few differences between us as to facts, little would remain to be said were it not for a serious divergence of opinion on certain points based upon these facts—1, the question of water supply to water-closets; 2, the insufficiency of your Board's sanitary staff; and 3, the closing of houses deemed unfit for human habitation.

With regard to the condition of the water-closets, your report attributes their foulness (and also the filthy state of many of the dwellings complained of) to the habits of the foreign Jews, of whom there has recently been a large influx. Without in any way admitting that the habits of these poor immigrants are at all inferior to those of the lower class of British poor, we desire to point out that the condition of the water-closets in the houses occupied by the British-born Jewish poor (unquestionably as cleanly in their habits as their non-Jewish neighbours) is radically bad in the Whitechapel district, and that there is, as a matter of fact, no difference between the condition of the closets in the houses occupied by our English poor and that of the closets in the houses occupied by our foreign poor. It is, indeed, practically impossible for water-closets to be kept clean, or for the drains leading therefrom to become other than stagnant cesspits, in the absence of sufficient water as a motive power for, and as a means of diluting, the sewage matter.

Your report quotes the opinion of your late most able and experienced officer of health, Dr. Liddle, who is stated to have long since discarded the principle of water supply to closets, and it adds that 'the system of a caretaker being appointed to flush the closets with water was substituted.' We desire to remind you that no such 'system' is in existence; that no 'caretaker' has ever been 'appointed' by your Board or by any one else to perform the hypothetical hand-flushing referred to; and consequently when your report tells us that 'this flushing of the closets with water thrown into them was adopted, and this mode of cleansing closets is approved by Dr. Loane,' your present excellent and zealous medical officer, your Board probably means to imply that if there were a caretaker to each water-closet, and if that caretaker were to effectually flush the closets by hand, that mode of cleansing would meet with the approval of Dr. Loane. But any person having the slightest practical acquaintance with the homes of the poor would at once see that the supposed hand-flushing is an impossibility, there being in such places neither pails nor other utensils at hand for the purpose, nor a sufficient stream of water from the small-bore ($\frac{1}{4}$ inch) taps in the yards to enable such an

operation as regular hand-flushing to be done with facility or efficiency. Dr. Liddle's opinion on any sanitary subject would always be received by us with the highest respect, but we cannot help thinking that his opinion which you quote in your report is rather out of date, having been founded on his experience of the old apparatus at that time in general use, and not on the improved and simple water supply arrangements, which are not easily subject to derangement or injury.

Setting aside all questions of opinion, the facts remain that in that part of the Whitechapel neighbourhood which lies within the City the Commissioners of Sewers have uniformly insisted upon water supply to all closets, that the houses so fitted are occupied by precisely the same class of people as those occupying the tenement houses in the district under the control of your Board, and that the result has been successful, there being a marked contrast between the condition of the houses of the poor in your district and those in the City. We submit that this practical experience is far more valuable than any opinion.

The suggestion in your report as to the formation of a staff of visitors to instruct and encourage the poor in the sanitary principles to be observed by them in their habitations, has long been anticipated by the Jewish Board of Guardians. For years past it has sent its honorary visitors, both ladies and gentlemen, to the homes of the poor, to impress upon them habits of cleanliness, and within the past two years the efforts of a fresh band of energetic and cultivated ladies have been exerted in the visitation of the Jewish poor. Further and more extended efforts in this direction are under consideration, and it is hoped that they may be productive of the results anticipated. But our visitors have always felt it to be useless to talk to the poor of cleanliness in the absence of a proper water supply. For this reason, in the year 1866, during the outbreak of cholera, the Jewish Board took the initiative of procuring for the poor a constant water service, and at its own expense erected stand-pipes—an example that was shortly after followed by your Board in several parts of the district—so giving the first impetus to the movement which has since happily resulted in a constant water supply throughout Whitechapel. For a like reason we now respectfully urge your Board to follow the excellent example set by the City of London by insisting on proper water supply to all closets in your district, such a measure being, in our judgment, equally essential to decency, cleanliness, and health.

With regard to the insufficiency of the present staff of two sanitary inspectors, we find nothing in your report that would alter the views expressed in our letter of Oct. 30. You state that 'your medical officer has expressed himself perfectly satisfied that the inspectors have been able to meet the necessities of the cases as they arose, and your committee are of opinion that they have done so.' This assurance emanating from your officer would, in ordinary circumstances, be quite satisfactory; but we would remind you that as long ago as 1868, your late respected medical officer addressed to your Board a strong printed remonstrance against the reduction of the staff of inspectors from four to two—a reduction which was accomplished in spite of his remonstrance. Although the number of houses in the district has been, since 1868, somewhat diminished, consequent on the operation of the

Artisans' Dwellings Act and other causes, yet the houses in the district have been so much further deteriorated by wear or tear that, to use the language of the report, they have to be 'continually watched by the sanitary officers of the Board.' How impossible such a work must be for a staff of two inspectors acting in a district containing 7,500 houses, the great majority of which are of an inferior class, has been shown so well by Dr. Liddle, your late medical officer of health, that we take leave to quote his opinion. After giving an elaborate calculation to show that in order to inspect the tenement houses of the district only once in three months, which he regards the minimum amount of inspection necessary, the work would occupy two strong active men their entire time working 7½ hours per day, making no allowance for interruptions, for meals, or for any other duties; and after detailing some of the other work required of the inspectors, such as the hearing and answering complaints at the Board's office, attending to stoppages in drains, abatement of noxious trades, preparing and serving notices on landlords, subsequently visiting to see to their compliance, supervising cow-houses, slaughter-houses, or bakehouses, seeing to the emptying of public dustbins, besides many other duties (more fully enumerated in his report of March 26, 1868), Dr. Liddle writes: 'I have probably said enough to show that I had fully considered the question relating to the number of inspectors who are required to perform the sanitary work of the district when I urged upon the Board not to diminish the number of the staff, but rather to increase the efficiency of it. If the Board agrees with me in thinking that the work should be done in the way I have pointed out, they must come to the conclusion that not less than four active young men are required for the purposes.'

We regret to find that there is some divergence of opinion between your Board and ourselves as to the degree of dilapidation, filth, and insanitary condition that would warrant you in pronouncing a house 'unfit for human habitation,' and that your report goes so far as to assert that 'the sensational description of the houses contained in the communication of the Jewish Guardians is not warranted by the facts.' As we submit that our remarks on this head were not sensational, but were a plain unvarnished statement of facts, we take occasion to quote them. We said: 'A large number of the houses in your district have been found so dilapidated as to be absolutely past remedy from a sanitary point of view. These are either so old, or have been neglected by their owners for so many years, that they may be considered rotten and poisonous throughout. The floors, walls, and ceilings reek with the impurities of half a century of neglect. There are also cases in which, apart from the rottenness of the structures themselves, the nature and position of the sanitary arrangements render the houses unfit for human habitation. We allude to such houses as have their water-closets situated in the basement immediately under inhabited rooms, or such as have their water-closets, dustbins, and water-taps accessible only through the cellars, which thus become receptacles of filth.' We assert without hesitation that most of the eighty-seven houses noted in our list as unfit for human habitation fully answer the foregoing description. Many of the houses referred to are in the Bell Lane area (which was condemned as long ago as 1877), and are still standing, crowded with inmates. Of these houses your late medical officer,

Dr. Liddle, reported to you in September 1877: 'The houses are in such an unhealthy state that they cannot be improved without the necessity of totally abolishing them.' If this was the state in 1877, there cannot be after a further seven years' wear much exaggeration in our statement that they are absolutely past remedy from a sanitary point of view. Yet these are the houses (and there are many more like them) condemned by your own medical officer in 1877, and which, after waiting for seven years, you hesitate to pronounce 'unfit for human habitation' and proper to be closed by a justice's order under the Nuisances Removal Act. Your report intimates that two unhealthy areas, the Bell Lane area and the Pearl Street area, are again proposed to be cleared under the Artisans' Dwellings Act. These schemes are already many years old, and they may or may not be adopted and carried out. But we submit most respectfully that no such prospect, even when not remote, should be allowed to so far paralyse the hand of your Board as to prevent its dealing in the meantime with such houses in the so-called condemned areas as may be 'unfit for human habitation.' Indeed, we submit by procuring the closing of such houses, you will be aiding the scheme, and lessening the cost of its execution to the Metropolitan Board of Works, and consequently to the ratepayers, as compensation would be based on the value of the bare land unencumbered by the houses and their tenancies. In other places where no 'scheme' is imminent, but where the houses are equally unfit for human habitation, such as parts of Pelham Street and Great Garden Street indicated on our list, the closing of the houses would be speedily followed by their demolition and reconstruction by the owners; and so the 'little by little' process of reconstruction—the suggestion of which seems to have excited the surprise of your Board, but which is after all the only natural process of improvement—would be accomplished without any cost whatever to the ratepayers, and without the necessity of displacing at one time the inhabitants of 'acres upon acres of houses,' and suffering their sites to lie useless and unproductive for years.

With respect to the penultimate paragraph in your report as to the encouragement given to occupiers to prefer their complaints to volunteer officials instead of directly to your Board, we venture to assert that the observations are not in any way applicable to the operations of this committee. Complaints as to sanitary defects are neither invited nor encouraged by us. Most of the sanitary grievances, of which we have written in our previous communications and in this letter, have come under the personal observation of my committee or its inspector in the course of their investigations. It appears also from your report that your Board objects to our issuing 'Notices for the Abatement of Nuisances,' as tending to inflate the value of our efforts at the expense of the recognised authority. We have certainly never issued 'Notices for the Abatement of Nuisances,' having no legal warranty to do so; but we have, in order to avoid the necessity of troubling your overworked officials unduly, and also to avoid delay, addressed letters to owners of houses where nuisances had been discovered, requesting an abatement of such nuisances; and we have much satisfaction in stating that the result of this arrangement has been so far successful that out of 402 cases in which we directly addressed the owners, 83 were attended to without your Board's interposition. We have thus troubled your officers

with only the balance of cases in which owners have ignored our letters.* But for this course our complaints to your Board would have been more numerous.

In conclusion, we regret that we cannot concur with your Board in finding the vital statistics of Whitechapel a subject of congratulation.

The death-rates quoted in your report for four quarters ending September 1884, are respectively 22·9, 18·9, 21·9, and 24·3 (an average of 22) per 1,000. These figures are probably far from accurate, being based on a doubtful estimate of the present population; and even this average death-rate (22 per 1,000) is greatly in excess of the general death-rate for London, which was 20·44 for 1883.

But, according to the best authorities, the true test of the sanitary or insanitary condition of a district is to be found in the infantile rate of mortality, and especially in the diarrhoea death-rate. Comparing your district with its neighbours—in 1883, Whitechapel had 78 deaths from diarrhoea to 2,472 births, or 3·1 per cent.; St. George's in the East had 56 deaths from diarrhoea to 1,901 births, or 2·9 per cent.; Shoreditch had 128 deaths from diarrhoea to 5,102 births, or 2·5 per cent.; Stepney had 53 deaths from diarrhoea to 2,153 births, or 2·5 per cent.; Bethnal Green had 89 deaths from diarrhoea to 5,310 births, or 1·7 per cent.; Mile End Old Town had 56 deaths from diarrhoea to 4,212 births, or 1·3 per cent.; Whitechapel thus appearing at the head of the list. This death-rate was considerably increased in 1884, the deaths from diarrhoea in Whitechapel having been 108 in 1884 against 78 in 1883. The report of your medical officer for the quarter ending last September states the infant mortality of Whitechapel to be 26 per cent. of the births, while that of London was only 22·2 per cent.; equal to 56 per cent. of the total deaths in Whitechapel, compared with the general London rate of 50·7 per cent. of the total deaths.

If, therefore, the vital statistics of your district point to any conclusion, it is this—that its sanitary condition is far below that of its neighbours, and it thus appears that a grave responsibility rests on your Board until more active measures are taken for its amelioration.

Signed, on behalf of all the members of the Sanitary Committee of the above Board,

LIONEL L. COHEN,
Chairman.

ALFRED TURNER, Esq.,
*Clerk to the Board of Works
for the Whitechapel District.*

* The form of letter sent to owners is as follows. It will be seen that it is not at all in the nature of a 'Notice.'

BOARD OF GUARDIANS FOR THE RELIEF OF THE JEWISH POOR.

Sanitary Department: 13 Devonshire Square, Bishopsgate, E.

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SIR,

Having been appointed by the above Board as Sanitary Inspector to report upon the condition of the dwellings of the Jewish Poor, I have visited the house number _____ of which I understand that you are the owner, and have found therein the sanitary defects mentioned below. I shall feel obliged by your taking such prompt and sufficient measures as may be needful for remedying such defects.

I am,
Yours obediently,

[The Inspector attends at the office of the Board daily, from 8.30 A.M. to 9.30 A.M.]

SMOKELESS HOUSES AND MANUFACTORIES.*

By THOMAS FLETCHER (of Warrington).

THE Council of the Institution having invited me to speak on the question of 'smokeless houses and manufactories,' have imposed on me a very congenial task. There is no possible doubt that all large towns can be made absolutely smokeless with economy, and also, that the strongly acid nature of the atmosphere in all large towns and cities can be very greatly improved. How bad the state of things in London is at present may be judged from the fact that, wanting some litmus paper, which is used in testing for weak acids, I failed totally to obtain any, after a long search, which was not already turned in colour by the acid of the atmosphere, and I had to telegraph direct to the makers for some. I held a strip of this paper out of a railway carriage window for a few seconds, with the result that the exposed part was turned red by the acid in the air. The mud in the streets, the damp stone walls, and even the moisture on the leaves of plants, all gave a distinct acid reaction. I have seen the leaves of plants, miles away from the city, burnt by a light shower after a fog in the city. When our towns are smokeless the total consumption of fuel will be decreased enormously, as I will prove to you, both in houses and manufactories. The most advanced users of fuel are beginning to see through the fog and smoke, and I believe it is now a question of a very limited time before we see the end of the nuisance. The question of smoke must be looked at from a money point of view, and smoke abatement must be either compulsory or profitable. Not one householder or manufacturer in a thousand cares how much smoke he makes provided it goes the right way up his chimney. My principal business to-night is to give you actual results obtained in my own works and house, which are, and have been for a long time, practically smokeless. The house was built with the ordinary fireplaces for coal, an open fire range with boiler, hot-water cylinder, and the usual appliances. What it would cost to work this with coal entirely I cannot tell you, for the simple reason that gas has been used, more or less, since the house was built. Those who have had experience with coal will be able to compare the figures as to comparative cost. In the first place, absolutely no alteration has been made with any existing fireplaces or fittings, except that a large gas meter and good-sized gas pipes have been fixed. The extensions as regards gas have been gradual, and in the last eight years probably 5*l.* may have been expended in gas fittings, to get a large service to every room in the house. The first cost of the whole of the appliances, gas fireplaces, cooking, water-heating, bath-heating, washing, drying, ironing, &c., at 'Stores' prices, for the house, which contains thirteen rooms, would be about 26*l.* Of the three sitting-rooms, two are used only at intervals, and fires are used in at least three bedrooms every night and every morning for about seven months in the year, fires being also lighted whilst the bedrooms are being used as dressing-rooms. The whole of the cooking for ten persons, water-heating for baths, and general domestic purposes, and a portion of the washing and drying (sometimes all) are done entirely by gas.

Now comes the question of cost. In the first

place, it would be practically impossible to have coal fires in the bedrooms, both night and morning, as we have them, and here gas scores one important advantage. If it were possible, there would be with us at least twelve fires to be lighted every day for six or seven months. This, and the consequent cleaning, would be nearly, if not quite, one servant's work; in fact, if the extra labour in cooking by fire and the usual style of washing are added, there would certainly be quite the work of a servant, which, for seven months, would mean in food and wages at least 16*l.* Our total gas bill for twelve months has been, on an average, with gas at 3*s.* 3*d.* per 1,000, 8*l.* for lighting and 13*l.* to 14*l.* for all other service, *i.e.* fires, washing, cooking, and baths. This for the last two years may be considered an experiment, and, being so, no doubt has had extra supervision, which, when discontinued, may possibly mean 5*l.* or 6*l.* per annum in extra waste; but the fact remains that with ordinary care the work has been done in a style totally impossible with coal, for two years in succession, at about the same cost as coal, and with a great saving in servants, dirt, and inconvenience. Further than this, whilst one of the children was suffering from scarlet fever, we were enabled to maintain perfect isolation in the upper part of the house, and so prevent the spread of the disease—a matter almost if not quite impossible if gas had not been available for all purposes. From what I can learn, it would appear that in the districts where coal is plentiful and comparatively cheap, it costs about 7*l.* per annum for the kitchen fire and about 3*l.* each for sitting-room and nursery fires. In London, where coal is twice as costly as with us, I do not believe the actual expenditure per annum is on the average any higher, the fire grates being very much smaller, and the lavish expenditure of coal common in the north is checked in this neighbourhood by its excessive cost. Many English cooks will burn one hundred pounds or more of coal in preparing a dinner; on the other side, I may refer to some tests made for the Committee of the Gas Institute, and published November 1884. In one of them, with a consumption of 25 cubic feet of gas, which is in fuel value equal to about one pound of coal, the work done was 7½*lbs.* mutton roasted (not baked), 1½*lbs.* soles grilled, 5*lbs.* potatoes roasted, a rice pudding, rhubarb tart, and samples of puff pastry baked, the weights of the latter three dishes not being taken. The whole of the cooking was very well done. I do not wish you to imagine that even this small quantity of gas fuel was absolutely necessary, as the actual heat absorbed by the food whilst being cooked would not be one-fourth of this. There is a limit to excessive economy in the fact that the necessary arrangements for this are not always either cheap or easy to manage for such irregular work as domestic cookery. We have rather large and straggling plant houses and conservatory, the boiler of which is heated by coke, this giving a smokeless chimney. I am not an advocate of smoke prevention as it has been commonly dealt with, as an abstract matter which is desirable at any cost, and I would not use any of the arrangements referred to except as a matter of direct advantage. I am only an average mortal, and consider my own pocket and convenience.

One of the difficulties with gas has been that for kitchen purposes an open fire is sometimes a necessity, and this, the missing link between the old and new systems, I think we have at last succeeded in

* Abridged from a lecture delivered at the Parkes Museum on March 26, 1885.

obtaining, by a gas fire which will roast, bake, heat water, and warm the kitchen with a single burner. Those whom business calls into closely-populated districts in the early morning will, I think, agree with me that private houses, as a whole, are as great a nuisance as regards smoke as manufactories. The people employed in a works will, as a total, make more smoke and create a greater nuisance with their house chimneys than is made in the works. The workman's wife can, by the use of gas, save herself a great amount of hard dirty work and reduce her expenses to a greater degree even than those who are in a better position in worldly matters. There is one point against the adoption of coal gas as a general fuel for domestic purposes in the fact that it has been, and still is, almost invariably sold at an exorbitant price.

My recent statement in the *Journal of the Society of Arts*, that we carry on a manufactory employing 130 (and more recently 140) hands, with the necessary steam power, forges, fires, &c., without any smoke, has called forth many comments and expressions of disbelief. I can only say that if our chimneys, which are fifteen in number, have a smoky end, it is outside and in full view from the Warrington station on the London and North-Western Railway. Coke is used for the fires and forges, simply as a matter of economy, and the steam boiler is worked also with coke, occasionally assisted by a very small quantity of slack, a space of about half of an inch being open under the boiler furnace doors to supply a thin film of air over the surface of the fire. Our steam boiler, to those who do not know it, is a joke: it is an old-fashioned, externally fired, egg-ended pattern, 15 feet long, 3 feet 6 inches diameter, with a fire 3 feet wide and 2 feet 8 inches long, and a shallow flue 5 inches deep, the whole length of the boiler, without return. It fortunately happens that Mr. Paterson, the president of the Manchester District Association of Gas Engineers, has been making experiments on the evaporative power of coke and coal in a double-flued Lancashire boiler, 18 feet long and 6 feet diameter, the cost of which is about three times that of my own, and the space occupied being more than double. In this boiler, with two fires, he evaporated an average of 724.5 lbs. of water per hour, using 1 lb. of coal for every 8.05 lbs. of water converted into steam. With coke, in the same boiler, he evaporated 765.3 lbs. per hour, with an average of 7.8 lbs. of water per lb. of coke. In our small boiler, with a single fire, we have evaporated in a twelve days' test 1,000 lbs. of water per hour, and the average fuel consumption for two years has been, as near as I can possibly estimate, 1 lb. of coke to every 7½ lbs. of water made into steam: the exact figures to decimals are not available, because we use from the same coke supply for the blacksmith's fires. The credit of the high duty of the boiler may fairly be given to the width and shallowness of the flue and firebox, and with a very good reason. The boiler inspectors objected to the flues preventing proper external examination, so we cut the setting away, making a deep flue of the usual form. As a matter of experiment this was left open for six months, and our fuel consumption went up about 20 per cent. We now fill the deep flue behind the bridge with loose bricks, so that they can be removed for inspection of the boiler, and our fuel consumption has dropped to its normal level. You will bear in mind that I do not recommend so small a boiler to be worked so hard as to evaporate

1,000 lbs. of water per hour, as it is extremely difficult to prevent priming, but the fact that we can on an emergency get, with a good engine and expansion valves, about 30 horse-power indicated from a boiler 15 feet by 3 feet 6 inches with coke as fuel, is, I think, an unanswerable argument in favour of a smokeless boiler. The fire bars are 12 inches from the bottom of the boiler, rather thick fires are used, and the boiler is, at every inspection, reported to be in first-rate condition by the Manchester Steam Users' Association, who are perhaps the most independent and hard to please of any boiler insurance company in existence. If it paid better to have a smoky chimney we should have one, so far as the nuisance inspector would permit. Steam users have occasionally tried coke as a fuel and failed to keep up steam: an explanation of this failure has been afforded by our having for a time to drive the boiler to its maximum possible power. After clinkering the bars a thick mass of cold and possibly damp coke is thrown on, which, under ordinary circumstances, affects the supply of steam at once. If, at the time of firing, a thin scattering of slack is thrown on the top of the coke, a clear smokeless flame rises instantly, which keeps up the steam until the coke is fairly incandescent and capable of doing the work: if, when driving our hardest, we had omitted to do this, we, like some others, should have failed to obtain satisfactory results, although this assistance from slack is never required except when hard firing and excessive driving of the boilers is a necessity. We have in the Lancashire district a large number of works which, in the opinion of the proprietors, cannot be carried on without making smoke. At the Leeds meeting of the Society of Engineers my lecture on flameless combustion was received as a curiosity, and the demonstrations were taken as laboratory experiments rather than possible commercial facts. That they created a strong impression in the minds of earnest experimenters was proved by the communications received from scientific men all over the world. The value of the possible application of this system of heating has been fully appreciated as an abstract idea, and endeavours have been made to reduce it to practice on a commercial scale. I think the honour of having first applied it practically in large furnaces may fairly be given to Mr. F. Radcliffe, the forge manager at the Royal Arsenal, Woolwich. In a steel-making furnace of the simplest construction and of exceedingly low cost he has combined a gas-producer of almost unlimited power, from which the hot gas is taken direct into the furnace, a simple continuous regenerator, and a furnace of a power which we may fairly say is practically almost unlimited. With the direct introduction of the hot gas into the furnace he obtains a heat of any character required, and a regenerator which is free from liability to choke with burnt pitch and exceedingly simple and cheap in construction. The small amount of waste heat, which in the present experimental furnace goes into the chimney, can with ease be utilised to make steam for the power which is always required for dealing with the products of the furnace. I have examined this furnace whilst in full work, and have also looked into the chimney, and both were as free from flame and dirt as this room.

We may take it as an accomplished fact that small, compact, and cheap furnaces can be built which will make gas from the poorest fuels and will give a pure flameless heat of any character and of

any required intensity. It is simply a question of form and detail to adapt this system, not only to the open hearth steel furnace in which it is now used, but also for iron puddling, all classes of reverberatory furnace work, glass-making, heating gas-retorts, and in fact any purpose where high temperatures and continuous heat are wanted. The waste heat is always needed for steam raising, and after this there are many other industries to which any remaining heat could be applied. There are several purposes to which gas is applied to a limited extent, and matters are at present in a state of transition. Amongst these I may mention bakers' ovens and furnaces for stained glass and enamels. No doubt in a short time these and other matters will be worked out so fully as to make the adoption of gas-fuel a necessity of the trades; a beginning has been made, and a little time now is needed to perfect the arrangements, which, up to the present, do not fill all necessary requirements for every trade as to simplicity, convenience, and economy. The ground has been cleared by independent experimenters, and I think it may fairly be said that both houses and all manufacturing industries can be profitably carried on absolutely without smoke, and it is simply a question of time as to when this state of things becomes general throughout the world. The future of gaseous fuel is settled beyond all question on the best of all possible grounds, that it is profitable to use, and users of solid fuel will soon discontinue their present system when they learn their position in the matter.

THE PASSIONATE STATISTICIAN TO HIS LOVE.—*(Modelled upon Marlowe).*—We commend the following remarkably clever parody to the attention of those of our statistical subscribers who have not yet met with it. It may strengthen their predilection for their useful study:—
'For my part, I am a passionate statistician. . . . Go with me into the study of statistics, and I will make you all enthusiasts in statistics.'—*Mr. Goschen at Whitechapel.*

Come live with me, and be my love,
And we will all the pleasures prove
That facts and figures can supply
Unto the Statist's ravished eye.

And we will sit 'midst faction's shocks
And calculate the price of Stocks,
The music of whose rise and fall
Beats most melodious madrigal.

We'll learn how the last Census closes,
And the art of counting noses;
And taste the pleasures, sweetly solemn,
Of abstract brief, and lengthy column.

We'll tot the figures fair and full
Relating to the price of wool,
The annual range of heat and cold,
The death-rate, and the price of gold.

Percentages shall stir our blood,
Analyses as clear as mud,
Oh, if these pleasures may thee move,
Come live with me, and be my love.

The marriage rate, the price of meat,
Shall yield us raptures calm and sweet;
And analytic 'Tables' be
Prepared each day to give us glee.

Economists our praise shall sing,
The Statesman's eloquence we'll wing
If these delights thy mind may move,
Then live with me, and be my love. —*Punch.*

THE DOGMATISM OF SANITARY REFORMERS.

By D. J. EBBETTS.

II.

To continue my remarks upon this subject, I would select for consideration the recognised rule that the wastes from all sanitary fittings should be trapped. If I select again a valve water-closet apparatus, and ask whether it is really necessary to fix a trap under this fitting, I find that every authority (with one exception) appears to assume the necessity for it.

In considering the general utility of such traps, we must bear in mind that each trap diminishes to some extent the force of the discharge passing through it, retains at times some offensive matter within the dwelling, and becomes, under certain circumstances, the object of elaborate precautions against syphonage. In the presence of these considerations I suppose I may take it that it is very desirable to avoid the use of traps whenever we can safely do so.

Now, if we look at other popular varieties of closets—for instance, those of the 'wash out' or 'hopper' kinds—we find that they are provided with S traps. This one trap is considered to afford sufficient protection to closets of these kinds. Then why should two traps be required for a valve water-closet?

A valve closet has a mechanical valve that closes the outlet of the basin, retaining in it a large volume of water. Why should it be necessary to fix a syphon trap under this valve? It is generally said that the mechanism may fail, or a piece of paper may catch on the edge of the valve and so prevent it from shutting close enough to retain the water in the basin. And so, as it is just possible that the valve may fail, a trap is placed under it; but where is this process to end? If the trap fails, what then?

We must remember that the trap is as certainly liable to failure as the valve. It may be placed sufficiently out of level so that it becomes a trap no longer; it may be emptied by capillary attraction. By-the-bye, not at all an unusual occurrence. Rag, paper, string, or matted hair, dipping into the water at one end, and extending over the bend at the other, soon empty the trap by capillary attraction, combined with the evaporation from the greatly increased surface of water exposed to the air. Traps may be unsealed by evaporation alone, and lastly by syphonage.

Now, the last danger is one that is very generally recognised, and if we examine a stack of, say, three valve-closets, one over the other as usually erected, we shall find each trap has an air-pipe branched into a vertical ventilation-pipe, which latter is carried up to a safe height; so that, through not being content with the valve as a sufficient protection for the closet, we have to fix traps under them, and then have to provide the latter with air and ventilation-pipes. Truly a complicated state of affairs, even if a necessary one.

But it will be noticed that the other objections to the use of the trap are not remedied by the addition of these pipes, and that one of the objections—namely, the unsealing by evaporation—is actually and very considerably increased by means of them. A current of air being established through these ventilation pipes and in immediate vicinity to the traps, the evaporation necessarily becomes very

rapid. Colonel Waring, the well-known sanitary engineer, having examined the a large number of experiments upon this ys: 'I believe most firmly that when the back ventilation, as now practised, is all the traps of a house, the destruction by evaporation will be much more to be n syphonage would be in the same set of t vented.'

to be borne in mind that by ventilating e seriously increase the liability of its con- frozen; which is certainly a considera- e weighed in estimating the supposed of using traps in the position that I am o.

it is admitted that a syphon trap is as ilure as the valve under the basin, it will at there is this difference between the two in favour of the valve, that while on nd the trap might fail in some way and acquainted with the fact, so, on the other ie valve were to fail, the fact would be all and, in any decent household, would s being immediately put in order.

g then, as I have said, that every unneces- should be abolished, I should prefer not to nder a valve w.c. apparatus, omitting, of the same time, the cumbrous air and pipes.

mentioned that one authority at least ad- e omission of traps in the position which sidering; I alluded to Mr. Norman Shaw. al system of soil outlets which he uses has ribed and illustrated in the SANITARY as well as in some of the hand-books subject; and, having for six years ence of the working of several hundred aged in accordance with his ideas, I hat I have not been able as yet to dis- ill effects that have followed upon the f the trap.

suggest as probable that a great deal of laboration in modern internal plumbing s from our not fully recognising the great t has been effected in the arrangement of soil-pipes, &c.

e began to perceive the terrible dangers connected with the futile attempt to bottle as in closed drains and soil-pipes, we not work to ventilate and purify the latter, at the same time elaborately ingenious r trapping and ventilating the internal s; whereas, if the drains and soil-pipes nged, and of such sizes that they are per- cleansing, and are, moreover, well venti- a very simple trapping of the wastes be all that is necessary, provided that we at dreadful bogey of syphonage.

ds me to consider (with some trepidation) lity of connecting the wastes of baths, &c., ipes. In the most advanced American ork it is usual to connect the trapped n washstands, baths, and sinks direct into e, and I have not been able to discover ctual harm has resulted from this practice erly carried out. But in England the nt in question is generally condemned in hatic manner. I am willing to admit that g the plumber's work of a new house one vell arrange for a separate waste-pipe to and lavatories, &c., but in modifying the

arrangement of old houses (which, as I have said before, must be accomplished with the severest regard to economy that is compatible with efficiency, if such work is ever to gain favour with the mass of house-holders), in work of this kind it appears to me that no real objection need be taken to such a course, provided—1stly, that the waste is trapped and secure against syphonage; 2ndly, that the soil-pipe and the drains are, as I have suggested they should be, perfectly cleansed and fully ventilated.

I have so far attempted to show that there are various things insisted upon by sanitary authorities in a rather unyielding manner, that cannot, I think, be necessarily considered as invariable essentials of good work. On the other hand, it might, I fancy, be shown that there are details of modern sanitary work which appear to be rather lost sight of by the same authorities.

To take one small example, how do you find the trapping of bath and lavatory wastes and overflows arranged by most authorities? Generally the overflow and waste are connected before the latter enters the trap. And this arrangement may certainly be seen often enough even in work executed under the supervision of engineers of experience.

Now, if we imagine a basin filled with water, and suppose the plug to be suddenly lifted, the water will descend the waste-pipe, but being, of course, materially retarded by the increased friction consequent upon passing through the trap, it will rise in the overflow-pipe to very nearly the same level as in the basin. The same thing would necessarily happen with a bath similarly fitted.

The column of water, ascending the overflow-pipe quickly enough, would carry soap and other floating impurities with it, and as it slowly descended again these impurities would in part be deposited upon the interior of the overflow-pipe and would form a slime whose decomposition would produce gases readily escaping into the fitting and the room.

Many may, at first sight, think that this defect is but a small one, but it is one that requires no great ingenuity to overcome, and is, therefore, a defect which it is not necessary that anyone should accept as inevitable.

Without considering at present the various ways in which this imperfect arrangement may be avoided, I may point out that it is often possible to take the overflow direct through the external wall, and to discharge it in the open, with proper protection from a back draught of cold air.

If I have not succeeded in convincing any one of the truth of any of the propositions which I have advanced, I hope I may have done some good in my attempt to persuade people to think out all details for themselves, without necessarily accepting the somewhat imperious dictates of many of our instructors—men, in many cases, may be, to whom we owe a great deal, but who are apt very often, I think, to overlay a simple subject with an elaboration of precautions, increasing thereby the complication and costliness of all work, and inviting the ridicule of the unbelievers; a sure means of preventing what we should all help forward—the spread of sound, simple, and clear views upon the subject amongst the masses.

A MILK-SELLER of Quarrington has been fined 5*l.* and 2*l.* 4*s.* 6*d.* costs by the Sleaford magistrates for largely adulterating his milk with water.

CHEAP COOKING FOR THE PEOPLE.

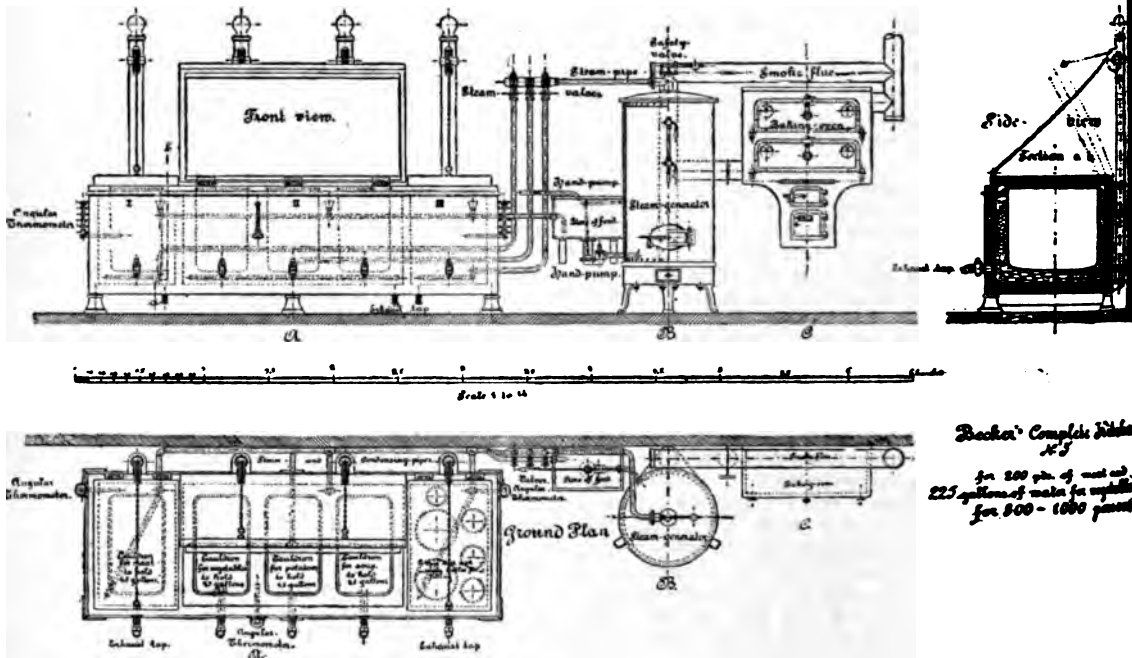
By H. FORBES CLARKE.

MUCH attention has lately been called to the importance of cheap cooking for the people. The success of penny dinners in London, and perhaps even more so in some parts of the country during the past winter, has led to the natural question, If so much benefit can be derived by children, why cannot similar advantages be provided for adults at a correspondingly increased cost? As honorary secretary of the Central Council for Promoting Self-supporting Penny Dinners, I have had several in-

great trouble to solve the question of cheap food in the most satisfactory manner. At the kitchen opened by him in October last, pea-soup and lentil-soup are sold at 1d. a quart, potato stew at 1½d. a quart, raisin pudding 12 ounces for 1d., and whole-meal bread 14 ounces for 1d. In the dining-room, 7 ounces of bread and a pint of soup are supplied for 1d., so that, as a gentleman high in authority who takes a great interest in the subject—and who on personally inspecting the dining arrangements found the soup most excellent—has observed, 'If a man only has a second penny, he can make a rattling good dinner for 2d.' The first balance-sheet, showing a considerable profit, has proved that on a strictly commercial basis dinners of a most



Becker's Patent Cooking Apparatus. (Patented in all countries.)



quiries on this subject. The Sisters of the Convent of Mercy, Galway, were desirous of providing cheap teas and suppers for factory girls; the secretary of a flax manufacturing company at Belfast wished to supply cheap meals for the workpeople, and a lady at Roubaix, France, has sought information on behalf of the girls employed in her father's cotton factory. Nearer home, one gentleman in the City wrote respecting dinners for errand-boys, and another wanted to know if substantial dinners could be supplied for 2d. or 3d. each for workmen. This has already been done at Gateshead by the Rev. W. Moore Ede, the rector, who has taken

nourishing and satisfactory character can be provided at a cheap rate to cover all expenses. The essential condition for the success of such efforts is economical cooking, and the principal requisites of this are small cost of fuel, and, especially, little waste of food. Both of these are secured in Carl Becker's Patent Cooking Apparatus, which has been in use for two years on the Continent, and can now be seen in full working order at the St. Pancras Workhouse, where the inventor, as a practical experiment, has fitted up, at his own expense, a large-size apparatus capable of cooking from 800 to 1,000 dinners daily. The accompanying block gives

an accurate illustration of the apparatus which is in use in thirty kitchens in Stockholm which have been opened by Mr. L. O. Smith, the ex-Brandy King of Sweden, who has studied the question of cheap cooking for many years. The Rev. Moore Ede, who visited Stockholm on purpose to see what Mr. Smith was doing, thus describes Mr. Becker's apparatus :—It consists of a large oblong box, the outer case of which is lined with non-conducting material, and the interior is divided into three compartments (the number varies according to the size) by partitions of non-conducting material. This box contains water, which is raised to the required temperature by means of jets of steam, and in this heated water are placed the pans in which the cooking is done. Each pan may be described as an oven heated by warm water. Owing to the division into three compartments, separated from one another by non-conducting material, it is possible to cook at the same time and in the same apparatus at three different temperatures, and thus to secure to each class of food exactly the amount of heat required, neither more nor less. Also, owing to the manner in which the heat is applied by means of external application of warm water, it is possible to cook very slowly, and thus to secure the perfect cooking of every portion.

The following advantages are claimed for this apparatus, which is extensively used by the German Government, and is also in private use in Germany, Austria, Italy, and, as already mentioned, in Stockholm :—

1. A saving of from 60 to 70 per cent. of fuel.
2. The food is prevented from being burnt or over-cooked.
3. The nourishing substances of food are more efficiently prepared for digestion, and many kinds of food are increased in bulk, so that more people can be fed from a given quantity of raw material.
4. The food thus prepared gains in taste and flavour.
5. The cooked food can be preserved in the air-tight pans for four or five days.
6. Scrupulous cleanliness can be observed.
7. Labour in cooking is much diminished.

A personal inspection of the apparatus at St. Pancras Workhouse has convinced me that it is well adapted for the thorough cooking of various foods, with considerable economy of fuel. On a recent Sunday morning Mr. Becker undertook by his apparatus to save 10 per cent. of raw meat and yet to supply the prescribed weight of ration for each inmate, and he successfully accomplished this; 450 lbs. of bacon, when cooked by his method, yielded as much food as 500 lbs. cooked by the ordinary method. On another occasion pork weighing 163 lbs. when put into the pans was found to weigh 161 lbs. when cooked. In cooking meat the water is never heated to boiling point; each pan is provided with a thermometer, and when the desired heat is obtained the steam is shut off. As the water only loses a small proportion of its heat during the night it requires very little steam the next morning to make it ready for cooking again, and so considerable fuel is saved. Another advantage, especially in summer, is that the temperature of the kitchen during cooking is hardly raised, nor does any smell escape from the pans, which are hermetically sealed by means of copper rims fixed to the covers, which, when shut, are surrounded by water.

It will be seen by the foregoing description that

Mr. Becker's cooking apparatus is well suited for cheap cooking, and if adopted in this country would doubtless give the same beneficial results which are obtained by it in other countries. His address is 42 Finsbury Pavement, E.C.

MR. E. H. SHORLAND, of St. Gabriel's Works, Manchester, is now supplying his Patent Manchester Grates, Manchester Stoves, to the new Board Schools, Stanwix; Infirmary, Bradford; Board Schools, Skipton; Industrial Schools, Wilton Gilbert; New Seamen's Barracks, Devonport; Central Station, Liverpool; Central Station, Warrington; Sedburgh Grammar School Sanatorium; Cottage Hospital, Maidenhead; Manchester, Sheffield, and Lincolnshire Railway Company's New Offices, Manchester; National Provincial Bank of England, Manchester; Masham Grammar School; New Schools, Lincoln; New Schools, Wrexham; and numerous other public and private buildings. Mr. Shorland has also received a letter from Messrs. Edgington and Summerbell, of Windsor, saying that the Vertical Ventilating Tubes supplied by him to the British Orphan, Slough, the Windsor Infirmary, and other places are acting exceedingly well, and giving entire satisfaction.

LORD CAMPERDOWN'S WATER RATE REGULATION BILL.—The eight metropolitan water companies have forwarded to the members of the Select Committee on this Bill the terms of an amendment which, if accepted by the Committee, will reconcile the companies to the provisions of the Bill. The nature of the amendment is that the companies shall not have power to cut off water in order to enforce payment of rates until a period of twenty-one days shall have elapsed after the delivery of full particulars to the consumer, and if within that period he applies to a magistrate to fix the amount of the claim then the companies' powers are not to be exercised until the magistrate has decided the dispute between the parties. The metropolitan companies are of opinion that, so far as the metropolis is concerned, this would afford sufficient protection to the consumer and, at the same time, leave in the possession of the companies an effective weapon for enforcing payment of their rates. They offer no objection to the provision of the Bill requiring them to furnish the particulars of their charge, unless it be that they do not think that this need be done every quarter.

SMALL-POX AT DURHAM.—Dr. Barron, the Medical Officer of the city of Durham, reports that out of 400 cases in nine months 39 proved fatal. It is fully believed that if a proper hospital or other efficient means of isolation of patients had been provided at the outbreak of the epidemic the number of cases and the mortality would have been much reduced.

PLOTS AND STRATAGEMS.—A general shopkeeper named Ware, residing at Preston, was charged before the Wingham (Kent) magistrates on the 4th inst., under the Sale of Food and Drug Act, with selling spurious butter. It was found upon analysis to be composed entirely of fat foreign to butter; and upon the defendant pleading guilty he was convicted and fined 48s., which included costs. The sample of the precious compound was obtained by a police-constable attired as a country labourer.

THE POLLUTION OF RIVERS.—The horrible condition of the River Churnet was brought forward and keenly discussed at the meeting of the Leek Guardians and Rural Sanitary Authority on the 1st inst., and the following resolution passed unanimously :—'That notice be given by the Clerk to the Leek Improvement Commissioners, requiring them to abate, without further delay, the nuisance caused by the pollution of the River Churnet by sewage matter, dye-water, solid refuse, and other matters, in accordance with the provisions of the Rivers Pollution Act, and other Acts of Parliament having that object.' It was stated, in the course of the discussion, that the Rural Sanitary Authority had given the Commissioners a six months' notice nearly five years ago.

THE SANITARY RECORD.

APRIL 15, 1885.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

Local Authorities throughout the country would confer a favour on the EDITOR of the SANITARY RECORD by forwarding to him all documents relative to Water-supply, Sanitation, and Health matters generally, which come under their notice. He would also be glad to receive reports from Engineers of Waterworks, Sewerage Projects, and Domestic Drainage Improvements for notice, comment, and illustration.

THE SALE OF UNWHOLESOME MILK.

It is a fact, now well recognised, that milk may be a most dangerous vehicle for the conveyance of infection. The milk itself may be to all appearance fresh and wholesome, but in the families which drink it disease breaks out. Serious epidemics have taken place, which have been clearly traceable to the milk coming from some particular farm where it was exposed to contamination. With such cases the law at present is practically powerless to deal. Under the Public Health Act it is an offence to sell or expose for sale milk which is 'diseased or unsound, or unwholesome, or unfit for the food of man;' but no sanitary inspector could detect the germs latent in apparently good milk, and no magistrate would be likely to condemn such milk. The premises where it is sold in towns are usually kept clean, and the milk is not exposed to contamination there. The milk dealer takes care of this, for if his premises looked unattractive he might lose his customers. The contamination is at a place far distant from the shop, at the farm where the milk is produced, or at the house of the middleman in the country who buys milk from the farmers in order to send up to the town. The person who, without care for anything but his own profit, exposes milk to contamination and so exposes numbers of people who are not his neighbours to the risk of being poisoned, is the person whom the law ought to reach, but at present he enjoys a practical impunity. It is very doubtful whether the milk on his premises could be condemned under the provisions of the Public Health Act, however unsound and unfit for food it might be proved to be; for it would generally while there not be exposed for sale. What is wanted is some efficient means of preventing milk, which is afterwards to be used for human food, from any risk of exposure to contamination.

Unfortunately the Public Health Act contains no section enabling anyone to see to and enforce cleanliness in dairies. Such a power is, however,

given by Section 34 of the Contagious Diseases (Animals) Act, 1878, 41 & 42 Vict. c. 74. That section enables the Privy Council to make orders for registration of all persons carrying on the trade of cow-keepers, dairymen, or purveyors of milk, and for securing cleanliness of milk stores, milk shops, and vessels for containing milk for sale, and also for prescribing precautions for protecting milk against infection or contamination. In accordance with this section a general order in Council was issued on July 9, 1879, and is still in force. Under it all dairies must be registered, and proper precautions must be taken for ensuring cleanliness and protecting the milk from all risk of contamination. The carrying out of this order is entrusted to the bodies who are constituted local authorities for the purposes of the Contagious Diseases (Animals) Act, but those bodies are not the same as the local authorities whose duty it is to carry out the requirements of the Public Health Act. Whether a farmer or milk dealer in the country has ever been prosecuted for exposing milk to the risk of contamination, we do not know; but, if such prosecutions ever take place, they are so rare as to afford no security for the Order in Council being obeyed, and we doubt whether the majority of farmers who produce milk in the country for sale are even aware that their premises ought to be registered.

The policy of the law under which the duty of enforcing regulations as to milk is imposed on bodies who have no interest in enforcing them, and every interest in doing nothing, may well be doubted. But at present the justices of the county, under the Contagious Diseases Act, and the poor law guardians, under the Public Health Act, are the local authority who alone have any right to interfere with a farm where milk is polluted previously to being sold. The local authorities of the towns whose inhabitants are poisoned by it would be ready enough to prosecute; but the farmer does not keep his dairy, and seldom exposes the milk for sale, within the limits of their jurisdiction—he has usually parted with it before it gets there, to a shopkeeper who is innocent of all knowledge of the unwholesome place from which it comes—and consequently poisonous milk may be distributed without anyone being either prosecuted or punished. This state of the law obviously gives but an insufficient protection to the public health; and as the general law will not help them, some towns are anxious to get powers to protect themselves.

The Corporation of Bradford are promoting a Bill in Parliament this session which contains a clause enabling them to deal with any person 'supplying milk for sale or use within the borough, although such person may reside, or his dairy cowshed or milkshop may be situated, beyond the borough boundary.' This clause would effectually do away with the exemption from prosecution which the rural dealer in milk now enjoys, but it is objected to as unduly extending the jurisdiction of the borough authorities. There is some force in the objection, though we do not think that it should necessarily be fatal to any legislation in the proposed direction. The general principle of our law no doubt is that criminal jurisdiction should be exercised by tribunals which sit in the locality where the offence was committed; and this principle would be infringed by giving borough justices power to impose penalties in respect of cowsheds in the country, perhaps many miles away from their town.

There are certain seeming exceptions to this principle which seem to show that there would be no inconsistency in giving the proposed additional to the Bradford Bench—for instance, the cases of the Adulteration Acts where country farmers sold in towns for selling adulterated milk, or the Public Health Act for selling diseased meat. These seeming exceptions are in reality only cases in which the farmer commits an offence in a town, and in which he is therefore properly punished there, and not in the district where he lives in which he has not broken the law. The case is the same with regard to unwholesome milk; where a farmer can be shown to have sold it or exposed it in a town, he may be prosecuted in the town or so doing. It is, however, rarely possible to do this, and consequently the further powers are needed for. It seems to us that the requisite powers might be given to urban authorities if they were empowered to appear as prosecutors outside the urban district in cases where the conduct of a person supplying food endangered the health of persons within the district. They have such powers with respect to the sanction of the Attorney-General, with respect to pollutions of streams; and ought, we think, be trusted not to use any such powers vexatiously if they were allowed to prosecute before the magistrates of the district where the offence was committed. With this modification we are glad to see Bradford obtain Parliamentary powers for the clause which is contained in its petition, and further to see the general law amended so as to secure the same powers for the local sanitary authorities of all urban districts.

SMOKE ABATEMENT.

THE PROVISIONS for the purpose of abating the nuisance by smoke has been tentative and gradual. The history is instructive. The first Act was passed for the metropolis only (16 & 17 Vict., c. 128). It imposed a penalty on any person who, on or after August 1, 1854, uses any furnace which is not constructed as to consume or burn its own smoke, or which does not use any properly constructed furnace, or which does not use the best practicable means for preventing or counteracting the smoke or annoyance. The provisions were expressly made applicable to persons residing above London Bridge, as well as to persons in buildings used for manufactories. This was amended in 1856 (19 & 20 Vict., c. 107) by requiring that furnaces employed for the purpose of heating baths and washhouses, among those liable to the penalty, and extending to the houses the part of the premises within which steamers must keep their engines under control. The force of these Acts was weakened by a saving clause contained in the Act of 1853, which provides that 'the justices before any person may be summoned may remit the penalty, if they shall be of opinion that such person has constructed or altered his furnace as to consume or burn, as far as possible, all the smoke from such furnace, and has carefully attended to the same and consumed or burnt, as far as possible, the smoke arising from such furnace.' The next Act was the Sanitary Act, 1866 (29 & 30, c. 90), which applied to the Country generally, under which smoky chimneys were defined to be those liable to be dealt with summarily. 'Any person or furnace which does not, as far as

practicable, consume the smoke arising from the combustible used in such fireplace or furnace, used for working engines by steam, &c., and 'any chimney not being the chimney of a private dwelling-house sending forth black smoke in such quantity as to be a nuisance,' are the kind of chimneys with which that Act deals. But here again, as in the earlier metropolitan Acts, there is a saving clause under which 'the justices may hold that no nuisance is created within the meaning of the Act and dismiss the complaint, if they are satisfied that the fireplace or furnace is constructed in such a manner as to consume as far as practicable, having regard to the nature of the manufacture or trade all smoke arising therefrom, and that such fireplace or furnace has been carefully attended to by the person having the charge thereof.' The Act of 1866 has been repealed, except as regards the metropolis, by the Public Health Act 1875 (38 & 39 Vict. c. 55) but the above provisions are re-enacted verbatim by Sect. 91 of that Act, and they are now the provisions in force throughout the Country; for the metropolis the three Acts of 1853, 1856, and 1866 are still in force.

There can be no doubt that a certain mitigation of the smoke nuisance has been effected, and if the local authorities, whose duty it is to prosecute, and the magistrates who have to hear cases in which persons were charged with infringements of these provisions were really in earnest, much more might be done. Many persons, however, who habitually offend escape prosecution altogether; and where prosecutions are undertaken, and convictions obtained, the penalties imposed are often so small that manufacturers think it is worth while to take the risk of having to pay a fine rather than go to the expense of altering their furnaces so as to consume their smoke. A Bill has this year been introduced into the House of Lords, by Lord Stratheden and Campbell for the purpose of strengthening the hands of the local authorities in the metropolis, so as to secure a more complete abatement of smoke. Its main provisions are (1) to enable the local authorities in the different districts of the metropolis to make by-laws for prohibiting or regulating the emission of smoke from any building within their district. 2. To enable the Metropolitan Board of Works to make by-laws with reference to the construction of fireplaces or furnaces in any new buildings hereafter to be erected. 3. And repeal of the words which exempt the chimneys of private dwelling-houses from the operation of the Acts. As far as it goes, this Bill, if it becomes law, may be useful; but if it is to be passed, we think it ought to apply to the Country generally, and not merely to the metropolis. The Bill, however, does not touch the real cause of the comparative failure of the existing laws—i.e. the apathy of the local authorities, whose duty it is to enforce them. Laws, of course, cannot be self-acting, and courts can only impose penalties when offences are proved before them. We see no reason why neighbours who know of persistently smoky chimneys should not be allowed to institute prosecutions in respect of them. The danger of being ordered to pay costs if they failed to prove their case would, we think, be sufficient safeguard against such prosecutions being rashly undertaken. If this alteration, however, cannot be made in the law; at any rate, a power of instituting prosecutions for smoke might be safely given to the inspectors of factories, who are public officials, and who are free

from the suspicion under which local authorities labour, of wilfully neglecting to put the law in operation from reasons of self-interest. If the existing laws were put in force the smoke nuisance would be largely abated. Further legislation may be useful, but even at present much may be effected.

DEFYING THE LAW.

SITUATED in an obscure corner in Whitechapel, close to Leman Street Station, is the Mill Yard Chapel of the Seventh Day Baptists. The small burial-ground in its rear has, during the last few months, become famous from a legal point of view. The facts are these:—The London, Tilbury, and Southend Railway Company propose to acquire the ground for railway purposes, the trustees are anxious to sell it, but the Metropolitan Public Garden Association and the other promoters of the Act, which received the Royal assent last August, for the Prevention of Buildings on Disused Burial-grounds are opposing the company's Bill on the plea of its illegality. No doubt the owners of the ground are to be pitied; they are offered 6,500*l.* for the property, and with this sum could build a chapel elsewhere; therefore they fully intend to defy the Act, and will not yield without a hard struggle. But if the land is not acquired for railway purposes, is it to remain as it is? Here is the difficulty. The Seventh Day Baptists are tired of their little meeting-house in Whitechapel, and desire to start afresh in Mildmay Park; but how are they to have a new place of worship if they fail to sell the Mill Yard Chapel and Burial-ground? It would be well if some benevolent friend were to offer them another meeting-house (and there are several in London which are closed and useless, the Gibraltar Chapel, Bethnal Green Road, for instance), so that the site of the building and the burial-ground might be converted into a pleasant garden for the inhabitants of one of the most crowded parts of London.

That there would be railway-lines on three sides of the ground would not necessarily disturb the comfort of those who might use such a garden; the people living in the neighbourhood are accustomed to the constant noise of the trains, and the very fact that the railway-lines will be 40 feet above the ground shows that they must be much nearer to the windows of the houses than they would be to the garden below. The experience of the members of the Public Garden Association has taught them that even a quarter of an acre of ground, if laid out with trees, paths, and seats, is an immense boon in its neighbourhood, and is fully appreciated by those who live near enough to use it.

It is high time that the railway companies should be checked in their appropriation of open spaces, they have swallowed up enough already, burial-grounds, commons, parks, squares and private gardens have given way before them. In London alone they have annihilated at least a dozen burial-grounds, have run their lines through others, taking away considerable pieces of the ground, have indirectly caused the demolition of many more, and have destroyed several places of worship with vaults containing the remains of the dead. Among the offending railways are the Great Northern, Great Eastern, South-Eastern, London and North-Western, London Bridge and Charing Cross, and last, but not least, the District and Metropolitan

Railways. Public opinion upon such matters has changed very much of late; this was evident two years ago in the struggle of the London and North-Western Railway Company for St. James's burial-ground, Hampstead Road. The passing of Mr. Hollond's Act has proved a most useful step in the right direction, Londoners are learning to appreciate the efforts of those who are working so actively to secure additional open spaces in the overcrowded town, and they will take good care that in the Mill Yard and future cases the Act is not infringed, so that the disused burial-grounds of the metropolis may be saved from the encroachments of the railway companies as well as from the hands of the speculative builders.

SEASON TICKETS AND THE ARTISANS' DWELLINGS QUESTION.

FOLLOWING closely in point of time upon the observations with regard to railway facilities for artisans which we made in these columns last month, came the semi-official announcement that the railway companies were preparing for some considerable concessions in the way of working-men's tickets. It may be worth while, therefore, to trace these concessions to their source, and to appraise their value to the classes immediately interested.

About the middle of 1884 the Artisans', Labourers', and General Dwellings Company, failing to get any satisfactory assurances from the directors of the Great Northern Railway, presented a memorial to the Board of Trade, praying for an official inquiry, under the Cheap Trains Act of 1883, as to the sufficiency of the provision of workmen's trains on the Great Northern and Great Eastern Railways for the Noel Park (Wood Green) district. Mr. Chamberlain at once ordered an official inquiry, which was held both on the spot and at the Board of Trade offices by Major Marindin. Mr. Oakley, general manager of the Great Northern line, Mr. Birt, general manager of the Great Eastern line, and Mr. Farrant, the managing director of the Artisans' Dwellings Company, were examined, and Major Marindin was convinced of the insufficiency of the workmen's trains for that district. Thereupon the Board of Trade informed the railway companies that they were satisfied of the truth of the complaint of the insufficient accommodation, and (having in view the provisions of the Cheap Trains Act of 1883, making the running of workmen's trains up to eight o'clock in the morning compulsory) asked them what they proposed to do. The detailed scheme has not yet been sent in, but it is understood that, on the invitation of the general manager of the Great Northern Railway, who objects to run any more workmen's trains, and does not see his way to issue third-class season tickets (which is the real and equitable solution of the difficulty), the railway companies generally, and not only for London but for the suburbs of all large towns, propose to issue for all trains arriving at their destination up to 8 A.M., third-class return tickets at half the usual fares, the return journey to be made after 4 P.M. on usual days and after 12 on Saturdays.

It would be idle to deny that this is a great concession. But it is not all that the working classes are entitled to under the Cheap Trains Act of 1883, and it is possible that the concession now offered by the railway companies will facilitate their arrangements.

and alter their views as to the desirability of doing justice to the third-class passenger by giving him a season ticket at a fair and proportionate price. The limitation of the return journey to four clock and after is the most serious drawback in the scheme. Many men, especially in the building trades, have irregular hours of labour. They may leave their homes with fair weather, but when they get to their job, or after breakfast-time, rain may come on; they will then be dismissed for the day, but instead of being able to get back to their homes, they must, under the plan of the railway companies, wait about all day—most probably at a public-house—until the hour arrives when their ticket becomes available.

The remedy for this very undesirable state of affairs is the extension of season tickets to the third-class artisan passenger. We said our say on this subject last month, and have nothing now to add, except to hope that the Board of Trade will not be hoodwinked by the companies into the belief that by their proposed new action the requirements of the Cheap Trains Act are fully met.

WATER RATES.

DISPUTES between the London water companies and their customers as to the amount payable by way of water rates continue to be frequently reported in the newspapers; and on more than one occasion magistrates have decided the law to be, as we have previously pointed out it was, that the person who disputes the value put on his property by the company must take the necessary steps for having the value settled by a magistrate, and cannot content himself with refusing to pay the rates demanded. If he does, the company is justified under the Waterworks Clauses Act in cutting off the supply. This power is one which on sanitary grounds we should like to see taken away from the companies, or at any rate put under the control of the local authority or of a court of justice. A Bill is now before Parliament, introduced by Lord Camperdown, which proposes that this power shall be exercised only when an order for the purpose has been obtained from a Court of Summary Jurisdiction. The Bill was opposed by the water companies, who clearly attach value to the power they at present have; but as that power not only may be but is exercised in a manner detrimental to public health, we think the proposed restriction on its exercise is likely to be beneficial. The Bill further proposes to make it obligatory on water companies to give their customers a statement of the particulars by which the rate they demand is made out. That they should do this is admitted to be reasonable, and the proposed alteration is not seriously opposed. Whether even an unpretentious Bill like the above will become law this year is of course doubtful. If it does, consumers of water will do well to remember that the companies can at present cut off water in cases where the amount to be paid is in dispute, and that they have every disposition to use this power.

Other legislation affecting water companies has not been commenced this session. The necessity of getting the value of premises for purposes of water rates, ascertained independently of the valuation for poor rates and other similar purposes, is felt to be a grievance; and where the

valuation made for the poor rate is on the whole fairly made, as is the case in the metropolis, it certainly seems to be unnecessary to make a second valuation for the satisfaction of the company. Mr. Torrens's Bill for making water rates chargeable on the basis of the poor rate assessment has passed its second reading in the House of Commons, on the understanding that its operation is to be limited to the metropolis. If it passes into law, the London magistrates will be relieved from the troublesome duty of ascertaining the value of premises in case of disputes as to water rates. The Metropolis Valuation Act provides for the revaluation of all premises in the Metropolis every five years; and, if the water companies are given—as presumably they will be—the right of being heard on the question of the valuation of any house supplied by them, there is no reason to suppose that the alteration of the tribunal by whom the value is to be ascertained on which their rates are based, will work unfairly. Outside the metropolis there is at present no security for any regular periodical revaluation of property, and it is notorious that assessments in different districts vary greatly. It would be manifestly unfair to subject the rates, which water companies now levy under Parliamentary sanction, to capricious reductions at the hands of interested local tribunals; and, consequently, Mr. Torrens's Bill is now not to extend to the Country generally. The late Government introduced a Bill for the purpose of securing a general and equal valuation everywhere of property liable to taxation, whether for imperial or local purposes. That Bill failed to pass, and has not been reintroduced by the present Government. If ever it becomes law, water rates may fairly be made chargeable on the public assessment made under it; but while the assessments remain as capricious as they are now, companies, outside the metropolis, are in fairness entitled to have the value of property in case of dispute, ascertained specially for the purpose of their rates, and no tribunal seems likely to do this more satisfactorily than the magistrates on whom the duty is now imposed.

A case which was recently before the Queen's Bench Division (*Coleman v. West Middlesex Water Company*) raises a question which will be of importance, irrespective of the persons by whom the valuation of property is made. The point to be decided was what should be included in ascertaining the value of trade premises. The house as to which the dispute arose was a public-house, and in addition to the rent which would have been charged for it as an ordinary house, the tenant had made payments in respect of the licence and as a premium for the good-will of the business. The question was whether these payments were to be considered in arriving at a determination as to what was the annual value of the house, and the court determined that they were. Ever since the House of Lords, in *Dobbs's* case, settled that water rates were to be charged on an annual value arrived at in the same way as annual value is arrived at for purposes of poor rates, those acquainted with rating law have known that circumstances which enhance the value of property in the hands of its occupier must be considered, as well as circumstances which cause deductions to be made from the rent nominally paid. A licensed house is usually more valuable, and so commands more rent, than an ordinary dwelling-house; and it would consequently be rated higher to the poor rate. As water has to be paid

for, not according to the amount consumed, but according to the annual value of the premises to which it is supplied, it follows that higher water rates must be paid by business premises than by private houses of the same size. The announcement of this rule may be unpleasant to tradesmen, who are consumers of water, especially since the recent decision of Mr. Paget that a barber may properly be charged extra for the water he uses for shaving; but, until the rules of rating are altered, it must be accepted as correct.

NOTES OF THE MONTH.

THE SEWERAGE OF LONDON SUBURBS.

THE drainage of London proper is itself a sufficiently complicated question, but the sewerage of the outlying suburbs is a difficulty even greater. The parish of Tottenham is in despair about its drainage, and it has been suggested that the district should be annexed to the metropolis, so that it could get the benefit of the main drainage system. But the Metropolitan Board of Works have reported adversely to this suggestion, on the ground that special legislation would be required, and that 'in considering the question of the drainage of Tottenham, it would be further necessary to have regard to the possible expediency of taking the sewage from other localities in the valley of the Lea. Moreover, there is the larger question whether it would be expedient to deal with any particular portion of the outlying districts of the metropolis other than as part of a measure for the general extension of the drainage to the whole of the districts round London. On these grounds the Metropolitan Board, whilst willing to accept the responsibility for a larger area if imposed upon them by the legislature, could not undertake to help Tottenham out of its present difficulties. A number of members commented in very uncomplimentary language on the condition of the Lea, and one remarked that 'there seemed to be no body in existence to remove this crying evil' of the pollution of rivers by the drainage of towns. We fear that Tottenham is not alone in the imperfection of its sewerage: indeed, an organised and systematic inquiry into the sanitary administration of the whole of our metropolitan suburbs seems urgently called for.

'E PUR SI MUOVE.'

WHEN the grave and reverend seigniors at the Local Government Board can so far cast aside official prejudice and the lack of precedent as to sanction the appointment of a woman to the post of vaccination officer, it must be confessed that the times are moving on. We have always looked upon a vaccination officership as one of the least desirable of public appointments, from the point of view of the holder's comfort. The honest performance of the duties involves a great deal of inquisitorial investigation into the domestic arrangements of families, and a perpetual fight against the ignorance, carelessness, dilatoriness, if not positive wrong-headedness of parents. The householder's mental picture of a vaccination officer is a somewhat grubby and prying person, with exasperating forms that must be filled up under the direst penalties, and with a strong family likeness to the rate-collector. But a vision of better things arises now that the

Local Government Board have assented to the appointment of a 'young lady' as vaccination officer of the Fordingbridge Union. Instead of instinctively grasping the nearest available pail of dirty water at the approach of the emissary of the law, we may expect that the artisan mother will greet with open arms the sympathetic person who accepts the proffered chair, and artfully extracts the information which she desires whilst dandling the baby. The first shock of novelty once over, women will soon be the favourites at elections for vaccination officerships, and we shall cease by-and-by to be astonished at the temerity of the Fordingbridge Guardians in setting so novel a precedent. After all, there is nothing to disqualify a woman from filling most local offices if she be eligible in other respects. It has been judicially decided that she may be a commissioner of sewers, governor of a workhouse, keeper of a prison, gaoler, parish constable, returning officer for a Parliamentary election, guardian, and overseer of the poor. It is true that in the case of the last-named office the judges ungallantly remarked that a man ought to be appointed, but that, if there was no man available, a woman was the next best thing. Nor ought we to omit to mention another parochial office which it has been gravely ruled that a woman may properly hold. The Court of King's Bench laid down once upon a time that women were eligible for the office of sexton, and that women who were ratepayers might vote at the election: though the Court somewhat cruelly gave as its reason for not excluding them that this was 'an office that did not concern the public, or the care and inspection of the morals of the parishioners.' But this must have been long before 'women's rights' came within the range of practical politics.

THE FALLACIES OF WATER ANALYSIS.

THERE appears to be something like an organised revolt against approval or condemnation of potable water, according to the report of an analyst on its chemical constituents only. We noticed a case of the kind at Canterbury last month; and a similar instance has recently happened at Enfield. At Canterbury they seem to have quite a taste for litigation on the subject, for, subsequent to the occurrences reported in our last number, the Town Council sought to get closed the well of 'a maiden lady, who had drunk the water all her life, and had never suffered any ill effects.' The sanitary authority contended that the water was contaminated, and therefore dangerous to health. In support of this the town clerk produced the analysis of the East Kent public analyst, which was supported by the report of the medical officer of health, and also an analysis made by Dr. Corfield, medical officer of St. George's, Hanover Square. On the other hand, defendant's counsel read a report upon the water by Dr. Robinson, the health officer for the East Kent Sanitary District, to the effect that the water was not unsafe for drinking purposes, although the nitrates were high. Eventually the magistrates decided in favour of the sanitary authority, but granted permission for the water to be used for other than domestic purposes. We observe that a notice of appeal was given by the defendant; so that there is reason for hoping that the whole question will be investigated before a superior court of law.

THE LIFE-HISTORY OF PARLIAMENTARY RETURNS.

any judge from the utterances of politicians in the papers, so many depart-Parliamentary procedure appear to be in reform that we much fear a shout of derision for an improvement of such unconsidered Parliamentary returns. A member of Parliament who wants some information or statistics to garnish a speech or pamphlet with hopes to electrify society; or some persecuting constituent, with a similar end in view, sends an easily prepared skeleton form, which the member would like filled up by a Government department without further trouble to himself. What is more than to move for a return, say, of the number of potatoes consumed in each canteen of the barracks at home and abroad, thereby enabling the people as to the way in which the finances are frittered away, and enhancing the reputation of the mover of the return as a far more energetic politician, at one and the same time the Minister who has the responsibility of granting or refusing the proposed return is placed in a dilemma that if he, knowing it to be perfectly good and misleading, declines to grant it, he must answer for his refusal, and will almost inevitably make an enemy of the member whom he has helped, and so, for the sake of peace and quietness, he makes no objection to the return. It is then relegated to some subordinate clerk to prepare, in a quiet and without any indecent haste, and is in the fullness of time laid upon the table of the House. By-gets printed, and is circulated amongst the members as of readers for whom Blue-books have been sent. Few people feel the smallest spark of indignation in it; fewer still take the trouble to read it on the day of its final delivery to the tender hands of the butlerman is seldom long delayed. We deny that this is a sufficiently accurate life-history of the average Parliamentarian, and we will give him chapter and verse to the contrary.

TYPHOID FEVER AND CATTLE MANURE.

Report on the sanitary condition of Carlisle, 1884, Mr. W. Brown, the medical officer of Carlisle, records eleven cases of typhoid fever, which are associated with the existence of animal manure in such places as slaughter-houses, cow-houses, and buildings used for the dressing of tripe and other offal. These cases possess more than ordinary significance from the fact of their affording support to the views of Mr. Henry Lawrence, who has traced the origin of many cases of typhoid fever to a close connection with the presence of cattle manure. Mr. Lawrence, who formerly held the appointment of surgeon in the Colonial Department in the Cape Colony, gives the results of his experiences of typhoid fever at the various stations and other isolated places at the Cape during a period of twenty-five years, under circumstances where its *de novo* origin must, he holds, be indisputable, and where cattle manure in great quantity to infect the air or gain access to water was invariably the apparent cause of the disease. Mr. Lawrence, after giving a detailed account of a remarkable series of outbreaks where the possibility of infection by human beings was excluded, sums up his conclusions as follows:

‘Typhoid fever arises independently of infection from any other human being; having so arisen, it is communicable to others in the usual well-known ways. In the cases described where it has arisen *de novo*, cattle manure has been invariably present in sufficient quantity to infect the air or water used for drinking purposes. Typhoid has not been traced to the presence of horse or sheep manure, and epidemics of the disease in England are mostly referable to dairy farms. As long as dairies are considered safe in every other way, if there is no case of typhoid fever on the farm, so long, I believe, will they prove to be fresh centres for the distribution of the disease. While the question is still *sub judice*, great care should be exercised in keeping milk free from contamination by air or water infected with cattle manure. Apart from milk epidemics, the pollution of water used for domestic purposes with cattle manure, either by soakage from cattle inclosures or surface drainage of pasture land, is not uncommon. It has given rise, I believe, to several recorded epidemics not otherwise accounted for.’

THE BOUNDARY COMMISSION.

OUR readers may remember our indulging in a little speculation in the January number of the *SANITARY RECORD* as to what was to happen in case the limits of municipal boroughs—now, under the Redistribution Bill, to be unified with those of Parliamentary boroughs—were extended in the future under the provisions of local Acts. We asked whether in such a case the Parliamentary borough would expand by automatic process or remain unexpanded, or whether new redistribution on a microscopic scale would every now and then be necessary to readjust boundaries. We observe with considerable satisfaction that the point raised by us has been deemed worthy of consideration by the Boundary Commissioners, who, in their report presented to Parliament, comment on the growing desire of boroughs for municipal extension, and the frequent extensions which are sanctioned by Parliament without any concurrent extension of the Parliamentary boundaries. Their proposal for adjusting the boundaries in such a case is that a special report should be made to both Houses, so that provision may be made, if thought desirable, for the extension of the Parliamentary boundaries at the same time. But will not this tend rather to encourage spread-eagleism on the part of the more ambitious Corporations?

PRIVATE BILL LEGISLATION.

THERE appears to be no likelihood that the debate on our present system of private Bill legislation, started by Mr. Craig Sellar on an early evening of the session, will be renewed this side of the prorogation. So that the soothing advice of the Government to leave the question open for the next Parliament to grapple with will probably have, *volens volens*, to be accepted, although all the honours of the debate were with the advocates of reform. As to the particular method in which Parliament is to be relieved of the duties which are now performed by its most inefficient and perfunctory members there is no doubt considerable room for argument. No proposal yet made fully meets the case; but when horror is expressed at the

transfer of the Committee stage of Bills to judges, it is well to remember that similar objections were raised to turning over the hearing of election petitions to the judges—a reform which has since worked admirably. Attempts to amend the present system as to private Bills are still regarded in the House as rather a feeble kind of joke. It is hopeless to expect any reforms from within, unless what it is the fashion to call a 'healthy public opinion' on the subject is created without. And we are glad to observe that in this spirit the Association of Municipal Corporations, at its annual meeting held recently, passed a resolution 'That the present system of referring private Bills to a committee in the House of Lords, and to another committee in the House of Commons, occasions unnecessary delay and expense, and that it is expedient, in the interests of the public, that one committee only should sit upon private Bills, and that such committee should be composed of members of both Houses of Parliament.' Reform in this direction would no doubt be the best to begin with.

THE DRAINAGE OF THE LOWER THAMES VALLEY.

THE last word has not yet been written on this much-vexed and complicated question. We are not concerned for the moment as to whether it was the wisest course in the first instance to have set up a Joint Board for the drainage of the various sanitary areas in the Lower Thames Valley; but, the Board once established, it would be the height of folly at this time of day to resume the *status quo*. And this is the view which has evidently swayed the Local Government Board in arriving at a decision on Mr. Thornhill Harrison's report of the prolonged inquiry which he recently held into the proposed dissolution of the Lower Thames Valley Main Sewerage Board. The only district that the Whitehall Board will consent to sever from the Joint Board is Heston and Isleworth, the circumstances of which are peculiar. This particular district was not originally included in the combination, but was subsequently added at its own request. It is to a certain extent isolated from the remainder of the district, and has special facilities for disposing of its sewage in its own area. But these considerations do not apply in the case of the other districts that desired separation. There is the greatest difference of opinion on the part of the constituent authorities on the question of the dissolution of the district, and of the new districts necessary in the event of the district being dissolved. Difficulties similar to those which led to the constitution of the main sewerage district would infallibly arise, and if a scheme for the diversion of the sewage at a moderate cost could be devised there would be extreme difficulty in carrying it out except by a Joint Board. The Local Government Board are therefore not prepared to issue a provisional order for the dissolution of the main sewerage district, or the separation of any constituent district with the exception of Heston and Isleworth, though they are ready to grant a provisional order altering the present basis of contribution of the constituent districts and the terms of office by elected members. As to Sir Joseph Bazalgette's scheme, the Board are not at present prepared to approve of it, and if the Joint Board should determine to renew their application for sanction to a loan with a view to its being

carried out, the scheme should be carefully revised and perfected before it is submitted to the Board. The Board are also of opinion that before the Joint Board arrive at a final decision with regard to this scheme, they should fully consider whether it might not be practicable to adopt some other scheme which would provide for the disposal of the sewage outside the district of the Joint Board, and which would entail less cost.

THE VALUE OF VACCINATION.

THE Leicester anti-vaccinators are no doubt sufficiently proud of their imposing demonstration of the other day, with its phalanx of victimised parents, its cartloads of unpolluted children, its gallows for the effigy of Jenner, and its other crudities. It might have been worth while for the Government authorities to have had struck off a special edition of 20,000 copies of Dr. Gayton's recently issued pamphlet on vaccination, for presentation to each of the 20,000 demonstrators, though we suspect that, after all had been supplied, a good many of the pamphlets would have remained on hand. It is all very well for Mr. Hopwood and other leaders of the blind to use fine swelling language about the absolute inutility of vaccination and its powerlessness to affect small-pox. Let them read Dr. Gayton's figures—or, for the matter of that, any other recognised treatise on the subject—and then say how they hope to square those figures with the dogmas which they so persistently seek to establish. Dr. Gayton is eminently fair and practical. He argues from his own observations, and bases his conclusions on his own figures. He even makes admissions which to the strict disciple of Jenner may seem somewhat heterodox; and yet, after making every allowance, what is the outcome of the 10,403 cases which have come under his care?—an experience greater, we believe, in point of numbers than that of anyone else except the late Mr. Marson. Dr. Gayton analyses the mortality in great detail, but for our present purpose it may suffice to call attention to the following:—

	Number of Attacks.	Percentage of Deaths to Attacks.
Well Vaccinated Persons	2,085	8.97
Imperfectly Vaccinated	4,854	9.37
Said to be Vaccinated, but without evidence	1,295	27.18
Unvaccinated	2,169	43.70

We shall be interested to know how the anti-vaccinators propose to prove from these figures the impotence of vaccination to affect small-pox.

THE METROPOLITAN PUBLIC GARDEN ASSOCIATION.

At a meeting, held on April 7 at 83 Lancaster Gate, Colonel Burges in the chair, the secretary reported that the fund for giving work to unemployed labourers was being used in carrying out the various undertakings now in hand, and that about sixty *bona fide* unemployed men were working daily and working well at fourpence per hour in digging, planting, painting, &c. It was agreed to take over and lay out the Beaumont Burial-ground, a small cemetery in Stepney, and to offer to lay out several other disused burial-grounds in the metropolis; to

h their owners with regard to Soho Square, Trafalgar Square, Chelsea; to grant a sum of £1000 towards the expenses of the garden adjoining the squares, Whitechapel, and 5/6 to the public playground in Spicer Street, Mile End New Town; to give the resistance to the proposed appropriation of the Mill Yard Burial-ground, Whitechapel, for other purposes; and to offer seats for the ground adjoining Marylebone Parish Church. It was announced that the trustees of Red Lion Square, Trafalgar Square, Mile End, had agreed to give over these enclosures to the association, and that long these two gardens would be thrown open to the public. The secretary also reported that the playground in Union Road had been taken over by the Vestry of Newington, and that, owing to the presentation of the association, a portion of the land for sale south of Royal Mint Street, E., was reserved from being built upon, and made into a playground for the children of the neighbourhood, the question being the site of the Aldgate round. Many other subjects engaged the attention of the meeting, among which was the question of the opening of the squares in Belgravia where during the months when the residents of the surrounding houses are out of town.

DRAINAGE OF THE HOUSES OF PARLIAMENT.

We so often pointed out the moral of the Government Board—the arcanum of sanitary science being housed in a structure that for sanitary purposes probably transcends any other public building—recent erection, that we fear most of our countrymen by this time involuntarily shudder at the mention of the new Home Office. We turn to the drainage of the Palace at Westminster with considerable alacrity to an entirely original illustration of how not to do it, as shown in the drainage of the Palace at Westminster.

Last summer, odours unpleasantly suggestive of drains, offended the nostrils of our countrymen whilst they were toiling at St. Stephen's country's good. The ravages of cholera on the continent were in everybody's mouth when Lord Salisbury gave breath from the debates on the Local Government Bill; and it was universally felt that something must be done, to put a stop to these insufferable smells. Happily the holidays were approaching, and so members were soothed into comparative forgetfulness by the assurance that one of the inspectors of the Government should investigate the matter during the vacation. The matter has been investigated, and a nice state of affairs has been disclosed; the smells are waiting for the advent of the summer to reassert themselves, nobody has thought of the Local Government Bill, and the Local Government is still to stir the sleepy Office of Works into action. The report of the inspector who has inquired into the matter states that the main drainage of the House of Commons is very defective. The chief drain is enormously large, and out of proportion to the requirements of the buildings. It runs across the Speaker's yard and then along the south side of the Speaker's hall, and joins the main artery of the main drainage in Bridge Street. This chief drain is almost large enough for a walk upright in, and has actually been used by the officials conducting the examination to the point where the sewer passes under the Speaker's Yard, there is a sudden drop of 18 inches in the level. Beyond this point, and for some

60 or 70 feet, there is, and apparently has long been, a collection of stagnant and offensive deposit of the worst kind. This alone is sufficient to cause the odours which were so remarked last summer. Again, the average height of the sewage stream in the main Bridge Street drain is three feet. The Parliamentary sewer discharges into this only 18 inches above the bottom of the main drain. There is, therefore, a constant backflow of the sewage into the Parliamentary drain, whenever the main stream is over 18 inches in depth. The sewer-grating in the middle of the roadway at the point where Parliament Street and Bridge Street meet has, indeed, long possessed a peculiar fragrance of its own. We have often wondered how our hundreds of legislators, with their passion for asking questions on subjects of the most trivial kind, could pass by this grating day after day, and never think it worth while to draw attention in the House to its pestilential odour and ask whether the cause was known. The inspector's report supplies the answer as to the cause, and the remedy ought speedily to be forthcoming. The notions of the Parliamentary architect as to drain-ventilation appear to be simplicity itself. It has been hitherto fondly supposed that a thorough ventilation was established by means of the shaft that runs from the chief Parliamentary sewer up into the Clock Tower. During the session of Parliament, an enormous furnace is kept always burning in the Clock Tower night and day. With this the drain-ventilator is connected, in order that a strong current of air may be continually drawn upwards towards the purifying flames. It is now found, however, that the other end of the sewer has been hermetically closed! We cannot find in our heart to spoil the moral of this ingenuous little story by any comments of our own; but could anything possibly be more delightfully illustrative of the arts of the jerry-builder?

EPIDEMIC MORTALITY IN PARIS.

WHILE almost everywhere else the death-rate from preventable diseases is declining more or less rapidly, in Paris the last decade has witnessed an increase, most marked in those most immediately dependent on insanitary conditions, especially those connected with sewerage and water supply,—viz., diphtheria and enteric fever. M. Jacques Bertillon has furnished us with the following figures showing the death-rate per 100,000 living from several diseases:—

	Measles.	Whooping Cough.	Diphtheria.	Typhoid.
1865-69	32	10	43	54
1872-76	35	10	65	50
1877-80	39	19	100	(1877-79) 50
1881-83	46	20	97	(1881) 97 (1882) 95 (1883) 92

Diphtheria and typhoid have thus doubled during the last decade.

THE INFLUENCE OF SANITARY CONDITIONS ON HEALTH.

THE death-rate of Danzig before and since the introduction of an improved water supply and a regular system of sewerage furnishes another striking proof of the enormous influence exerted by such conditions as those of the soil and water on the

health of a town population, and of the true economy of expenditure, however apparently heavy it may seem. Not until the end of 1869 was that city provided with a public supply of pure water, and the present sewerage works on the system in vogue in most English towns were carried out about 1872. In the nine previous years the general death-rate was 36·39 per 1,000. Since 1871 it has been 28·56 or 7·83 per 1,000 less, although the latter period includes the small-pox epidemic of 1872, the heaviest since 1838, and the cholera of 1873.

But enteric fever is the disease in which these factors play the most important part, and the results in the case of Danzig are remarkable. From 1863-71 the enteric death-rates per 10,000 were 11·2, 7·7, 9·8, 12·3, 12·3, 8·9, 7·0, and 11·0, while from 1872 to 1883 they have been 8·0, 4·1, 5·1, 3·3, 2·6, 2·7, 1·9, 1·8, 0·8, 1·4, 2·1, and 1·0, giving for the former period an average of 9·9, and for the latter of 2·9, or for the last six years of 1·5. Even this figure does not give a fair idea of the actual mortality, for if we deduct the deaths in hospital of strangers from the neighbouring villages the rates for the last three years are found to be 1·1, 1·4, and 0·6.

It is worthy of notice that the enteric death-rate was not appreciably affected by the water supply alone; it was not until the completion, three or four years after the commencement of the sewerage works that the improvement became manifest.

SUPER VISION OF DRAINAGE WORK.

A VERY useful and complete code of regulations has been drawn up by a special committee of the Glasgow Corporation with regard to municipal supervision of the drainage of houses. The Lord Advocate has been invited to include them in his General Police Bill for Scotland, and it is certainly greatly to be wished that they had universal application. We have no space to give the code of regulations in its entirety, but must find room for those relating to the efficiency of the drains, which run as follows:—6. Sufficient traps and ventilation must be provided and fixed in position to the satisfaction of the Master of Works. 7. No pipes to be covered until inspected by the Master of Works or his representative; and no junction connecting drain pipes and plumber work to be covered up until examined and passed by him. 8. The Master of Works to have power to use the smoke test on all drains and plumber work before the building is occupied, and at any other time he may consider necessary; all expenses connected with the test to be paid for by the proprietor of the property. 9. No dwelling-house to be occupied until a certificate has been given by the Master of Works that the drains and cesspools, with traps, have been properly constructed and the house otherwise fit for occupation.

BIRMINGHAM PENNY DINNERS.

THE last of the series of penny dinners for children, inaugurated about the commencement of December last by Mrs. Birt Davies Coleman, at the Acorn Hotel in Birmingham, was given a few days since, upwards of 300 children being present. The 'wind-up' dinner consisted of Irish stew, plum-pudding, oranges, ginger beer, &c., and at its conclusion the children were entertained with a magic-lantern exhibition. These dinners, of which 5,814

have been supplied, have been carried on by Mrs. Coleman, with the aid of a number of friends, who have materially assisted in the charitable object in view by contributing articles of clothing for needy children. A number of these friends were present on the occasion in question, including Canon Bowlby, Mrs. Colonel Smythe and Misses Smythe, Miss Joanna Hill, and other well-known and philanthropically-inclined residents of the town and neighbourhood.

A COSTLY SEWER.

AT a recent meeting of the Birmingham Town Council, considerable discussion took place relative to a report presented by the Public Works Committee upon the cost of construction of an intercepting sewer running through the Cole Valley, and a branch sewer, which, when their construction was agreed to in 1881, were estimated to cost 28,000*l.*, and for which 30,000*l.* was borrowed. The work is now approaching completion, and it is found that the cost will be, not 28,000*l.*, but 62,000*l.* This excess has been occasioned principally by the nature of the ground in the line taken by the sewer, a great portion of it being running sand, which was only discovered when the work was too far advanced to render an alteration of route possible. It was explained that the intercepting sewer was a long one, extending something like seven miles, from Stratford Road, near Sparkhill, to the new sewage farm at Tyburn, and it would drain 3,855 acres of land, 956 of which were within the borough. The drainage of the district had been delivered into the River Cole, but such strong representations were made with regard to the pollution of the water occasioned thereby that the matter had to be taken in hand. Nine shafts were sunk along the line of route and no cause of difficulty was discovered. The first section of the work was given to Messrs. Aird and Co., but when that was finished and the pipes were brought across the Tame into the valley on the other side, it was found that the soil was extremely treacherous. Special arrangements were made with the contractors, who did not care to undertake such risky work at a fixed sum, and the sewer was proceeded with. It was found that the bad ground extended for 2,300 yards, and for 900 yards of this distance there was running sand of the worst description, which had to be taken out a bucketful at a time, and a tunnel constructed through it. Instead of about sixteen weeks in which that part of the sewer ought to have been constructed, it occupied about sixteen months, and a million and a half gallons of water per day were pumped out for six or seven months. Every yard of the tunnel, which in some parts was 35 feet deep, had to be shored up, and all the timber had to be left in when the work was completed. The cost of the sewer to the end of the bad ground, about 3,610 yards in all, was 35,666*l.*, or about 10*l.* per yard. It was agreed to sanction the borrowing of an additional 23,750*l.*

DESTITUTION AND THE DEATH-RATE.

AT the meeting of the Sanitary Committee of the Middlesbrough Town Council, held on the 7th inst., Dr. Malcolmson, Medical Officer of Health, reported that the death-rate of the west district of the south side of the town during the month of March showed an average of 30·95 in the thousand. In

answer to inquiries Dr. Malcolmson stated that this high death-rate arose from the excessive mortality amongst young children in that district, owing in a great degree to the great destitution that unfortunately existed there. In many of the houses there is not a single blanket, and many of the children do not have a single article of flannel underclothing, sides being very insufficiently fed. Alderman Chibald said that he was able from personal observation to corroborate Dr. Malcolmson's statement, who, in answer to further inquiries, suggested that if each child could have a quart of milk daily, some flannel underclothing, and a blanket at night, it would tend more than anything else he could suggest to a diminution of the death-rate.

THE PUBLIC HEALTH

DURING MARCH 1885.

The mean temperature during the month of March at the Royal Observatory, Greenwich, was $40^{\circ}3$; it was 5° below the average March temperature in one hundred years, and as much as $4^{\circ}2$ below that recorded in the same month of 1884. An excess of temperature prevailed on twelve days of the month, while on the other sixteen days it was below the average. The warmest day of the month was the 4th, when the mean was 50° , and showed an excess of $6^{\circ}5$; the coldest day was the 22nd, when the mean did not exceed $34^{\circ}7$, was $7^{\circ}0$ below the average. Rain was measured at Greenwich on eight days during the month, to the aggregate amount of 1.5 inches, which was slightly below the average March rainfall in sixty-one years, though it exceeded that recorded in the corresponding month of any of the three preceding years. During the first quarter of this year the rainfall has amounted to 5.3 inches, which was 0.3 of an inch above the average for the same period of sixty-one years. The sun was above the horizon during 366.9 hours in March, but only 105.5 hours of bright sunshine were recorded at Greenwich; the amount was below the average of the third month of the five preceding years, though it considerably exceeded that registered in March 1884. The wind was very variable throughout the month.

In the twenty-eight large English towns dealt with by the Registrar-General in his weekly return, which have an estimated population of nearly nine millions of persons, 157 births and 19,216 deaths were registered during five weeks ending the 4th inst. The annual birth-rate, which had been 36.4 and 35.6 per 1,000 in the first two months of the current year, further declined to 34.2 during March, and was below that recorded in the corresponding month of either of the two preceding years 1883-84. In the twenty-eight towns the lowest birth-rates last month were 26.1 in Brighton, 27.6 in Halifax, and 29.2 in Portsmouth; in the other towns the rates ranged upwards to 40.1 in Sunderland, 40.4 in Cardiff, and 40.7 in Newcastle-upon-Tyne. The birth-rate in London last month was equal to an annual rate of 33.2 per 1,000, while it averaged 35.0 in the twenty-seven provincial towns.

The annual death-rate in the twenty-eight towns, which had been 24.4 and 21.2 per 1,000 in the two preceding months, rose again to 22.5 during March. The rate slightly exceeded that recorded in the corresponding period of 1884, which was equal to 22.0 per 1,000.

The lowest rate of mortality last month in these towns was 16.9 in Brighton. The rates in the other towns, arranged in order from the lowest, were as follow:—Derby, 17.5; Birkenhead, 18.2; Hull, 18.8; Portsmouth, 19.3; South, 20.0; Bradford, 20.1; Birmingham, 20.2; Salisbury, 20.5; Leicester, 20.9; Sheffield, 21.1; London, 21.5; Leeds, 21.5; Wolverhampton, 22.3; Nottingham,

22.4; Halifax, 22.4; Huddersfield, 23.4; Blackburn, 23.9; Norwich, 24.4; Liverpool, 25.1; Bristol, 25.2; Bolton, 27.1; Preston, 27.1; Manchester, 27.1; Newcastle-upon-Tyne, 30.4; Oldham, 30.5; Cardiff, 32.3; and the highest rate during the month, 43.0 in Sunderland. While the death-rate in London, as above stated, did not exceed 21.2 per 1,000, it averaged 23.7 in the twenty-seven provincial towns. The 19,216 deaths from all causes in the twenty-eight towns during the five weeks of March included 2,153 which were referred to the principal zymotic diseases, of which 775 resulted from measles, 604 from whooping-cough, 183 from 'fever' (principally enteric), 178 from scarlet fever, 158 from diarrhoea, 131 from small-pox, and 124 from diphtheria. These 2,153 deaths were equal to 11.2 per cent. of the total deaths, and to an annual rate of 2.52 per 1,000. This zymotic rate showed a further increase upon those in the two preceding months, but was below that recorded in the corresponding period of 1884, which was 2.84 per 1,000. The zymotic death-rate in London during March was equal to 2.29 per 1,000; in the twenty-seven provincial towns it averaged 2.72, and ranged from 0.4 and 0.6 in Brighton and Derby, to 4.1 in Bristol, 5.3 in Newcastle-upon-Tyne, 8.3 in Cardiff, and 18.3 in Sunderland.

Measles was the most fatal zymotic disease in the twenty-eight towns during March. The rate of mortality from this disease in these towns, which had been 0.42 and 0.50 per 1,000 during the first two months of this year, further rose during March to 0.91, a higher rate than has been recorded in any month since June last. In London the death-rate from measles did not exceed 0.79 per 1,000, while in the twenty-seven provincial towns it averaged 1.01, and showed the highest proportional fatality in Newcastle-upon-Tyne, Cardiff, and Sunderland. In the last-mentioned town a serious epidemic of measles prevails, no fewer than 199 deaths being referred to that disease during the five weeks under notice, equal to an annual rate of 16.6 per 1,000. The death-rate from whooping-cough, which had been 0.66 and 0.65 per 1,000 in the two previous months, rose to 0.71 during March, but was considerably below the rate recorded in the corresponding month of last year; in London the rate of mortality from this disease was equal to 0.62 per 1,000, while it averaged 0.79 in the twenty-seven provincial towns, among which the highest rates were recorded in Cardiff, Preston, Bristol, and Oldham. The rate of mortality from 'fever' corresponded with that recorded in each of the two preceding months; in London the fever death-rate last month did not exceed 0.15 per 1,000, whereas it averaged 0.27 in the twenty-seven provincial towns, among which the highest rates were recorded in Newcastle-upon-Tyne and Norwich. The death-rate from scarlet fever, which had steadily declined during the four previous months from 0.45 to 0.29 per 1,000, further fell last month to 0.21, a lower rate than has been recorded in any month in recent years; this disease was proportionately most fatal in Leeds and Wolverhampton. The mortality from diarrhoeal diseases was slightly below the average for the corresponding period of recent years. The death-rate from diphtheria was equal to 0.15 per 1,000, and showed a further decline from the rates recorded in the first two months of this year; this disease was proportionately much more prevalent in London than in the aggregate of the provincial towns. During the five weeks of March 131 fatal cases of small-pox were recorded in the twenty-eight towns; the fatality of this disease showed a further decline from that in the two preceding months. Of these 131 deaths, 104 occurred in London, 9 in Manchester, 5 in Liverpool, 4 in Sunderland, 2 in Bradford, 2 in Newcastle-upon-Tyne, 1 in Birkenhead, 1 in Leeds, and 1 in Cardiff. Judged by the returns of the Metropolitan Asylum Hospitals, the prevalence of small-pox in London showed a further decline during March. The number of small-pox patients under treatment in these hospitals, which had been 1,147 and 1,103 at the end of the two preceding months, further fell to

879 at the end of March. The average weekly number of new patients admitted to these hospitals, which had been 248 and 203 during January and February last, further declined to 131 during March.

The rate of infant mortality in the twenty-eight towns, measured by the proportion of deaths under one year of age to births registered, was equal to 158 per 1,000 during March, against 171 and 143 in the corresponding periods of the two preceding years 1883 and 1884. While the rate of infant mortality did not exceed 148 per 1,000 in London, it averaged 167 in the twenty-seven provincial towns, among which it ranged from 89 in Derby, 101 in Wolverhampton, and 103 in Plymouth, to 201 in Newcastle-upon-Tyne, 212 in Bristol, 239 in Sunderland, and 271 in Cardiff.

The death-rate from diseases of the respiratory organs, judged by the metropolitan returns, was below the average during March. The weekly number of deaths referred to these diseases in London averaged 448, and the annual death-rate was equal to 5.7 per 1,000. In Liverpool the annual rate of mortality from these diseases was last month equal to 6.6 per 1,000.

The causes of 509 of the 19,216 deaths recorded in the twenty-eight towns during the five weeks of March were not certified, either by registered medical practitioners or by coroners. These uncertified deaths were equal to 2.7 per cent. of the total deaths, which exceeded that recorded in any recent month. In London the proportion of uncertified deaths did not exceed 1.4 per cent, while it averaged 3.6 in the twenty-seven provincial towns, ranging from 1.4 and 1.5 in Plymouth and Leicester, to 6.9 in Hull, 7.8 in Halifax, and 8.7 in Oldham.

Among the population living in the outer ring of suburban districts around London, estimated at rather more than a million persons, the annual death-rate during March from all causes was equal to 19.3 per 1,000, against 20.0 and 17.3 in the corresponding periods of 1883 and 1884. During the five weeks ending the 4th inst., 122 fatal cases of small-pox, 62 of whooping-cough, 38 of measles, 34 of diphtheria, 22 of 'fever,' 15 of scarlet fever, 13 of diarrhoea, were recorded in the outer ring. These 306 deaths were equal to an annual rate of 2.9 per 1,000, which showed a slight further increase upon that recorded in the first two months of the year. The fatality of measles, scarlet fever, and whooping-cough showed an increase, while that of diphtheria declined. Of the 122 deaths from small-pox recorded in the outer ring during March, 99 occurred in the district of West Ham (including 12 of London residents registered in the Metropolitan Asylum Hospital at Plaistow), 10 in Edmonton, 4 in Croydon, 4 in Brentford, and 2 in Kingston districts. Of the 34 fatal cases of diphtheria, 7 were returned in the sub-district of Tottenham.

NOTIFICATION OF INFECTIOUS DISEASES.

THE table on page 463 contains uniform statistics relating to sickness and mortality in thirty-one of the thirty-nine urban sanitary districts of England and Scotland in which the notification of infectious diseases is compulsory. The population of the thirty-one towns for which we are enabled to publish complete statistics for the month of March is estimated at rather more than three millions of persons. The annual death-rate from all causes during March in these thirty-one towns averaged 22.05 per 1,000 persons estimated to be living therein, against 24.12 and 21.03 in the first two months of the year. The rate of mortality in the twenty-eight towns dealt with by the Registrar-General in his weekly returns was 22.50 during March, and therefore was slightly above the rate in the thirty-one towns in the accompanying table. The death-rates last month were considerably below the average in Burton-upon-Trent, Derby, Accrington, Reading, Edinburgh, and Aberdeen; while they showed an excess in Jarrow, Burnley, Manchester, Oldham, and Stalybridge.

The death-rate from the eight infectious diseases dealt with in the table averaged 0.65 per 1,000, showing a slight further decline from the rates recorded in the five preceding months, which had steadily fallen from 0.98 to 0.67 per 1,000. No death from any of these infectious diseases was recorded last month in Accrington, Derby, Hartlepool, Heywood, or Lancaster; while in the other towns the rates ranged upwards to 1.17 per 1,000 in Portsmouth, 1.27 in Greenock, 1.56 in Burnley, 1.76 in Leek, and 2.19 in Rotherham. Seven deaths were referred to small-pox in Manchester, 2 in Bradford, and 1 in Birkenhead, during the month under notice; scarlet fever was proportionally most fatal in Halifax, Preston, and Rotherham; enteric fever in Blackburn, Portsmouth, and Burnley; and diphtheria in Edinburgh and Portsmouth. Two deaths from typhus were recorded in Edinburgh, 3 in Greenock, and 2 from puerperal fever in Burnley. With regard to the notified cases of infectious disease in these thirty-one towns, it appears that the proportion of persons reported to be suffering from one or other of the eight diseases specified in the table was 4.75 per 1,000, against rates declining from 7.92 to 4.66 in the five preceding months. While the proportion was under 1 per 1,000 in Accrington, Heywood, Lancaster, and Warrington, it ranged upwards in the other towns to 7.28 in Halifax, 7.56 in Leicester, 8.51 in Edinburgh, 8.91 in Greenock, and 14.99 in Rotherham. The excessive rates recorded in the last-mentioned towns were due to the prevalence of scarlet fever. Thirty-one cases of small-pox were notified in Manchester, and 3 in Yarrow; scarlet fever showed the greatest proportional prevalence in Edinburgh, Leicester, Halifax, and Rotherham; enteric fever in Blackburn, Burnley, Portsmouth, and Rotherham; diphtheria in Burton-upon-Trent, Edinburgh, and Portsmouth; and 3 cases of puerperal fever were notified in Manchester during last month.

During the first quarter of this year the rate of mortality in these urban sanitary districts has been equal to 22.21 per 1,000, against 23.36 in twenty-eight of the largest English towns. With regard to the proportion of deaths to reported cases during this period, it appears that the mortality of scarlet fever was equal to 9.0 per cent. of the cases notified; of enteric fever to 17.4 per cent.; and of diphtheria to as much as 39.2 per cent.

FEVER HOSPITALS.—The Felling Local Board have instructed their surveyor to prepare plans for the erection of a fever hospital to accommodate twelve patients.

THE March number of the *Western Temperance Herald* gives some interesting particulars, accompanied by a table, showing a list of thirty workhouses within the area of operations of the Western Temperance League which have respectively the lowest and highest cost for consumption of stimulants for each inmate. Of the thirty Unions included in the list those having the lowest expenditure for intoxicating drinks, fourteen—or nearly one-half—are in Devon and Cornwall, and Axminster heads the list with a cost of only 1d. per head, Falmouth comes next with 1½d., Helston and Bideford 1½d. each, St. Columb 4½d., Launceston 6½d., St. Austell 7d., Holesworthy 9d., Devonport 10½d., Liskeard 1s. 1½d., Kingsbridge 1s. 2½d., Bodmin 1s. 4½d., Truro 1s. 9½d., and Stonehouse 1s. 11½d. Amongst the thirty Unions in which the highest cost for consumption is shown, there is not a single West-country workhouse, and of this number Romsey stands lowest on the list with a consumption per head of 10s. 9½d., or nearly 9s. above the highest of those which show the least average expenditure, viz., Stonehouse. Gower heads the whole list with an expenditure of 24s. per head. It is deserving of mention, also, that for thirteen years not a penny has been expended at Wrexham Workhouse upon intoxicants for the paupers, and there are hundreds of Unions throughout the country where either no wine, or no spirits, or no malt liquor is consumed by the paupers at the ratepayers' expense.

Towns.	Estimated Population Middle of 1885.	Small-pox.		Scarlet Fever.		Diphtheria.		Typhus Fever.		Enteric Fever.		Cholera.		Relapsing Fever.		Puerperal Fever.		Totals of Preceding Columns.		Annual Rate per 1,000 Persons Living.		Deaths from other Zymotic Diseases.				Total Mortality from all Causes per 1,000 Persons Living.
		Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Ill-defined Fever.	Measles.	Whooping-Cough.	Dysentery.	
Aberdeen	113,212	—	—	10	1	2	—	—	—	12	—	—	—	—	—	—	—	24	4	230	0.42	—	—	—	—	18.2
Accrington	35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.67	0.00	—	—	—	—	17.84
Barrow-in-Furness	59,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19.04
Birkenhead	93,000	—	—	34	2	—	—	—	—	—	—	—	—	—	—	—	—	37	4	4.63	0.50	—	—	—	—	23.71
Blackburn	110,500	—	—	19	2	—	—	—	—	6	4	—	—	—	—	—	—	25	6	2.95	0.71	—	—	—	—	23.71
Blackpool	110,085	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	23.21
Bolton	114,431	—	—	7	—	—	—	—	—	—	—	—	—	—	—	—	—	10	2	1.18	0.24	—	—	—	—	20.67
Bradford	175,000	—	—	50	6	3	—	—	—	7	2	—	—	—	—	—	—	60	11	3.6	0.7	—	—	—	—	25.68
Burnley	67,000	—	—	11	—	—	—	—	—	—	—	—	—	—	—	—	—	33	8	0.42	1.5	—	—	—	—	15.28
Burton-on-Trent	45,507	—	—	14	1	2	—	—	—	1	2	—	—	—	—	—	—	17	3	4.40	0.78	—	—	—	—	24.41
Bury	55,000	—	—	17	1	—	—	—	—	6	2	—	—	—	—	—	—	23	3	5.45	0.71	—	—	—	—	24.41
Chadderton	17,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	27.41
Derby	87,668	—	—	19	—	—	—	—	—	2	—	—	—	—	—	—	—	19	4	1.40	0.31	—	—	—	—	21.97
Dundee	124,818	—	—	4	—	4	—	—	—	7	—	—	—	—	—	—	—	181	19	8.31	0.19	—	—	—	—	18.38
Edinburgh	250,615	—	—	129	3	11	8	1	2	42	6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19.33
Greenock	73,695	—	—	5	—	3	2	—	—	3	2	—	—	—	—	—	—	63	9	8.91	1.27	—	—	—	—	21.07
Halifax	77,000	—	—	37	3	1	—	—	—	5	2	—	—	—	—	—	—	43	6	7.38	1.02	—	—	—	—	23.57
Hartlepool	18,000	—	—	1	—	—	—	—	—	2	—	—	—	—	—	—	—	3	—	1.96	0.00	—	—	—	—	21.91
Heywood	25,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	0.94	0.00	—	—	—	—	22.41
Huddersfield	87,327	—	—	11	1	—	—	—	—	6	2	—	—	—	—	—	—	18	4	2.69	0.60	—	—	—	—	24.77
Jarrow	30,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	1	9.61	0.43	—	—	—	—	22.77
Lancaster	20,724	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	—	—	—	23.71
Leek	13,462	—	—	6	—	—	—	—	—	—	—	—	—	—	—	—	—	6	2	5.57	1.76	—	—	—	—	22.02
Leicester	136,147	—	—	96	2	2	—	—	—	10	1	—	—	—	—	—	—	79	4	7.56	0.38	—	—	—	—	22.02
Llandudno	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22.41
Macclesfield	37,641	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24.77
Manchester	341,598	—	—	40	6	2	—	—	—	32	9	—	—	—	—	—	—	112	24	42.8	0.92	—	—	—	—	22.77
Newcastle-on-Tyne	153,209	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	23.71
Norwich	91,215	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22.02
Nottingham	211,424	—	—	19	1	6	3	—	—	27	2	—	—	—	—	—	—	52	6	3.21	0.37	—	—	—	—	22.41
Oldham	126,392	—	—	11	1	2	—	—	—	4	2	—	—	—	—	—	—	20	6	0.66	0.62	—	—	—	—	20.79
Portsmouth	134,659	—	—	30	1	17	5	—	—	21	1	—	—	—	—	—	—	68	12	0.61	1.12	—	—	—	—	18.57
Preston	100,466	—	—	23	4	—	—	—	—	12	2	—	—	—	—	—	—	35	6	4.11	0.70	—	—	—	—	20.54
Reading	46,970	—	—	7	—	—	—	—	—	—	—	—	—	—	—	—	—	10	1	2.78	0.23	—	—	—	—	18.04
Rotherham	35,659	—	—	27	6	2	—	—	—	12	—	—	—	—	—	—	—	41	6	14.99	2.19	—	—	—	—	18.65
Salford	204,060	—	—	51	5	5	3	7	1	11	2	—	—	—	—	—	—	75	11	4.79	0.70	—	—	—	—	20.51
Stafford	20,252	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20.51
Stalybridge	26,931	—	—	5	1	—	—	—	—	—	—	—	—	—	—	—	—	8	1	3.97	0.18	—	—	—	—	20.51
Warrington	45,412	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1	0.57	0.20	—	—	—	—	21.24

SPECIAL REPORTS.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

Friday, March 20.

(T. ORME DUDFIELD, M.D., President, in the chair.)

THE following gentlemen were elected members of the society:—Nominated by Dr. T. Orme Dudfield and Mr. Shirley Murphy—Joseph Loane, M.R.C.P. Edin., M.O.H. Whitechapel; J. Shaw, M.R.C.S., M.O.H. Rotherhithe; Frank Argles, M.R.C.P. Edin., M.O.H. Wanstead. Nominated by Dr. C. E. Saunders and Mr. Shirley Murphy—W. Marston Clark, L.R.C.P. Lond., M.O.H. Twickenham; F. Carter, L.R.C.P. Lond., M.O.H. Billericay; W. G. Groves, M.R.C.S., M.O.H. Woodford; R. B. Rygate, M.B., M.O.H. St. George's-in-the-East.

The following were elected associates:—Edward C. Robins, F.S.A., F.R.I.B.A., and H. Saxon Snel, F.R.I.B.A.

Mr. Wynter Blyth, Medical Officer of Health for Marylebone, read a paper on—

THE ACTION OF DISINFECTANTS ON MICRO-ZÖIDS.

The author of the paper enumerated the diseases of animals and men, which may be considered beyond a doubt to have an intimate connection with micro-zöoids, viz., mouse and rabbit septicæmia; a fatal disease of the guinea-pig produced by the micrococcus tetragenus; the anthrax of animals and men; fowl cholera, glanders, malignant oedema; bovine and human tuberculosis; erysipelas; some forms of pneumonia; and acute osteo-myelitis. On the other hand, it had not been proved satisfactorily that diphtheria, scarlatina, relapsing fever, cholera, typhoid fever, and some others were due to micro-zöoids, though the balance of evidence seemed to be in favour of such a view. Probably zymotic diseases would come to be recognised as consisting essentially of the invasion of the tissues of individual mega-zöoids by legions of micro-zöoids.

The term 'disinfectant,' the author used throughout, as synonymous with 'germicide.' A colony of micro-zöoids submitted to a solution of a true disinfectant, and then having been freed from the disinfectant and put into the best possible conditions for development and growth, showed no signs of life; the colony had been disinfectant, that is, killed.

Hence, according to this view, disinfection meant either a destruction of pathogenic micro-zöoids or a poisoning of them, the effect being for practical purposes the same.

The author then briefly detailed his own experiments on spore anthrax, published in the Royal Society of Edinburgh's Transactions, and summarised the experiments of Schiff and Fischer on phthisical sputum, and those of Fischer and Proskauer on the action of chlorine and bromine. The author next observed that in continuation of his first research he had made some observations on mouse septicæmia; threads were infected with mouse septicæmia and soaked for half-an-hour in Tuson's disinfectant, a saturated solution of sulphate of iron (Morgan's fluid); a 10 per cent. alcoholic solution of cresylic acid; a 10 per cent. solution of sulphenic acid; a 10 per cent. solution of chlorozone, and a strong solution of chloride of zinc. The sulphenic acid and the alcoholic solution of cresylic acid disinfect the threads perfectly, but of the other agents some had no effect, others disinfect superficially.

His most recent research was on the pyridine bases; he had raised a pure cultivation (from the last stages of nasal catarrh) of a yellow bacillus, which liquefied gelatin, the liquid gelatin then becoming yellow and fluorescent; this bacillus produced spores of moderate resistance, was not pathogenic, and grew with convenient rapidity at ordinary temperatures. Threads infected with this yellow bacillus were soaked in a 1 per cent. solution of pyridine, collidine,

lutidine, and acridine, and then, having been freed from the disinfectant, they were brought upon nutrient gelatin; the threads were found to show no signs of growth around them, whereas the 'control' threads grew rapidly.

The antiseptic power of pyridine was tested on the organisms found in sour milk, and pyridine was shown to inhibit growth.

Since the pyridine bases are present in tobacco smoke, the smoke from an ordinary pipe of tobacco was passed through water, and the resulting solution was found to be, so far as the yellow bacillus is concerned, strongly disinfectant. The results of experiments with the yellow bacillus when treated with solutions of morphine, strychnine, atropine, and other alkaloids were also given, from which it would seem that strong solutions kill the bacillus.

Turning to the practical aspect of the question, the author summarised the general conclusions to be drawn from these researches.

Disinfectants, when they are not destructive agents, act as poisons. They poison the micro-zöoid in a manner not essentially different to the lethal poisoning of a higher life form, and this is the reason why such poisonous substances as corrosive sublimate, carbolic acid, and chlorine, are most to be relied upon.

It was evident that, to disinfect perfectly, the element of time must not be disregarded; to receive specific excreta in a strong solution of sulphate of iron or of carbolic acid, and then within a few minutes to cast the excreta into a drain, could only superficially disinfect, and such excreta might in many obvious ways again become dangerous.

He considered that the best and most efficient way to disinfect a room after disease was—

First, to make it as much as possible an hermetically sealed box, and in this box evolve chlorine—three pounds of chloride of lime and three pounds of hydrochloric acid for every 1,000 cubic feet of space. The chloride of lime was to be divided into several distinct parts in deep vessels, and to be placed not on the floor but as high as possible; the hydrochloric acid was to mix with the chloride of lime gradually in the manner detailed by Fischer and Proskauer. The room was to be shut up for twenty-four hours.

Secondly, all things in the room capable of being submitted to a moist heat were to be taken away to a suitable apparatus.

Thirdly, the floor was to be washed with a solution of corrosive sublimate (1 : 1,000).

The principles of this process had been carried out in the parish of St. Marylebone for more than a year; and he considered this method the best at present known.

DISCUSSION.

In the discussion which followed, the president, after moving a vote of thanks to Mr. Wynter Blyth for his interesting paper, observed that the subject of it had been dealt with more than once in recent years by the society, papers having been read by two former presidents, the late Dr. Letheby and Dr. Thomas Stevenson. The importance of the subject justified reconsideration of it from time to time. He could not help contrasting the results of disinfection as commonly practised with the views of the reader of the paper. Speaking from personal experience he was able to assert that disinfection of the sick room and its contents was, in practice, a success, notwithstanding the views propounded by Mr. Blyth as to the extreme difficulty of killing the organisms which were supposed to be the seeds of infection. He appealed to the practical experience of other medical officers of health whether this was not so, and whether they could not confirm his statement that when disinfection was carried out carefully, after the usual manner, infectious disease did not reappear in the disinfected house, always supposing that at the time of disinfection such disease was not in process of incubation. Occasionally disease—especially scarlet-fever—reappeared after the return of a patient from the hospital, and he suspected that, although the skin of the patient in such cases had apparently done peeling, there might be infectious

tangled about the roots of the hair. He believed occasionally the reappearance of disease was due to ration from disinfection, by the owner, of some article of clothing, &c., that had been exposed on. But cases of recrudescence of disease were in comparison with the total number of rooms, infected. As to the material used, Mr. Wynter preferred chlorine, and had suggested the use of &c., to protect metal surfaces from the attack of vermicide. Would not the coating protect the so? Dr. Thomas Stevenson had employed the use of carbon at St. Pancras, and had every reason satisfied with the results. In common with the of his colleagues he himself used sulphurous acid, as well satisfied with it as a disinfectant despite Mr. Wynter Blyth had said regarding its inefficiency as a vermicide.

Mr. E. Saunders, of Newington, agreed with the president that the use of sulphuring rooms had yielded trustworthy results for the last twenty-eight years he had relied on the method of disinfection. He doubted whether the expense attending the disinfection of bedding by super-heated steam was quite warranted, and never had reason to believe that the less expensive apparatus of Dr. Ransome had failed to do its duty.

Mr. E. Saunders took exception to the term 'microbe.' He thought that scientific terminology should rather be complicated by new names except for very special reasons. This name was really misleading, as it did as small life-like forms those which were in the forms, which meaning was properly conveyed by the word microbe.

Mr. Kingzett spoke of the destructive effect of chlorine tints in the apartments and in rusting steel and he admitted that there are some diseases—anthrax, diphtheria, and a few others—with which there was a direct connection between them and certain micro-organisms, but he did not think that these micro-organisms were the cause of the disease. It was to chemistry that they looked as to what constituted the diseases. He then proceeded to review the experiments of others, and said he differed *in toto* from Mr. Blyth. He compared the sanitas fluid with chlorine, and for his products all that could be claimed for disinfectants. He was now making further experiments which he hoped to bring before the society.

Mr. Moore said he had entered as a pupil at the Royal Sanitary and Health Exhibition, so as to settle in his mind some points of this question. He thought it was owned that micro-organisms are the cause of diseases. The yeast plant produced alcohol in fermentation of sugar, and others produced putrefaction, certain acids, and everybody must know that it produced anthrax. If a poison from an animal's body was inoculated into another animal it dies of the same disease. But it must be admitted that in a great many diseases the effect of this micro-organism is not proved, and perhaps never would be proved from direct observation, because many of the organisms are so small, small that they never will be seen even by micro-observation. He did not agree with all Mr. Blyth, and thought it would be only by experiment that he (Mr. Blyth) had pointed out that the fact proved that micro-organisms were the cause of diphtheria, &c. If something could be found that would doubt prevent the organisms from carrying on their work would be a great step. He could not agree with Mr. Blyth when he said that all disinfectants must be used.

The speaker was strongly of opinion that some disinfectant could be found which was not so. There was a disinfectant used by the Health Exhibition authorities on the occasion, and there was one paragraph in it which stated that some non-poisonous disinfectant might be found. It was upon an experiment made by a Frenchman upon a fungus, and it was found that this plant

could be grown under certain conditions. Steel was taken, and the growth was increased, and, if other things were added, the growth decreased. Silver was one of these. This was added, and the growth was completely stopped, and the plant was so sensitive that it would not grow in a silver vessel. He believed that it was probable that some disinfectant would be found, as the silver acted upon the plant. He thought Mr. Kingzett was right as to chlorine being so destructive; but practically he agreed with the president, in disinfecting the rooms by burning sulphur, taking off the wall papers, whitewashing, scrubbing the floors with carbolic, and having the clothes disinfected by heat; and this last point was an important one. Their secretary (Dr. Saunders) had taken the words out of his mouth as to an objection to the term 'micro-organisms' used by Mr. Blyth.

Mr. Corner confessed to some disappointment on the reading of Mr. Blyth's paper, because they would go away with no better means of disinfection than they had at present. It appeared to him that chemists, after directing their attention to this subject, had it brought home to them that what they had been doing was utterly valueless. Mr. Blyth's experiments appeared to have been directed towards a class of cases which they did not often deal with, and he had not applied his tests to small-pox, scarlet fever, and typhoid. It was in this direction that they wanted ground upon which to work. How did Mr. Blyth explain the disappearance of disease from a large number of houses in which no disinfection had been practised at all—perhaps one-half? What became of the infection in the remainder? It must die out, and, if so, what was the cause of it? If they could only stop the growth of these poisons for a time, until they were issued from the premises, and had disappeared into the drains (and the drains, if fairly disinfected, were not vehicles for disease), that would be something gained. He thought Mr. Blyth might, perhaps, have given them his opinion upon the experiments of Professor Lister's work, because from those experiments he believed they might be able to gain something very important. With regard to alcohol, he might refer to Mr. Hutchinson's practice. He (the speaker) had used it in hospital practice in the case of wounds and amputations, and he found a solution of spirit—one in three—had a powerful preventative effect in the cases of erysipelas, hospital gangrene, &c. Another point was that in disinfecting rooms the clothing of the people was left untouched, but if there was only one room what was to become of the people, who perhaps had no change of clothing. An institution was really needed in which poor people could enter to be bathed, and their clothing disinfected by heat. In twelve or twenty-four hours a system of disinfection could thus be carried out. The present system in such cases was only a half measure. In Poplar he used sulphur and dry heat, but he was not sure that it was not the turning out altogether and the general cleansing that did the good. He had experienced difficulty in destroying the infective character of threads used for ligatures, and this bore out the statement of Mr. Blyth that microbes attached themselves to threads with great tenacity.

The President remarked that with reference to Mr. Corner's remarks respecting the disease not appearing again when no disinfection had taken place, and as to the disease having died out; perhaps the poison had not always died out for long afterwards. He knew of a case in the country where the infection of scarlet fever had shown itself twelve months after the first outbreak.

Dr. Willoughby said, that with regard to Mr. Corner's remarks as to the disease dying out, they would only apply in some cases, because the persons who were most susceptible would succumb, while those who were not susceptible would escape, but a new case would come to the place, perhaps months after, would contract the disease. The speaker then referred to many authorities on the subject, concluding by suggesting that experiments should be made in respect of small-pox, enteric fever, &c.

Mr. Wynter Blyth, in reply, said with regard to the observations of the president as to whitewashing, taking off wall-papers, &c., that similar precautions were adopted by him. As to the difficulty of using chlorine, he might have rusted the steel and the fire-grates and destroyed the tints of the apartments, but he did not mind that so long as he disinfected the rooms properly. Dr. Saunders had taken exception to the term micro-zöoids, but 'zöoid' was a word very extensively used by all writers on zoology. He rather preferred the term, although it might be open to objection. He had received a paper from Mr. Kingzett, but he had not read it, as he wished whilst making his experiments to remain perfectly unbiassed. Dr. Moore had stated that there would be a non-poisonous disinfectant found; but it had to be found. He did not dispute that the ordinary disinfecting operations do get rid of a large amount of infection, but not all of it. With regard to experiments upon scarlet fever, measles, &c., such experiments were at present not possible.

The meeting then adjourned.

THE RECENT EPIDEMIC AT KIDDERMINSTER.

PROPOSED REMEDIAL MEASURES.

WITH a view to the remedying of the various sanitary defects found to exist in the town of Kidderminster, both in connection with the sewerage and the water supply, and to carry out the recommendations made by Dr. Parsons, the Local Government Board inspector, as the result of his inquiry into the cause of the recent outbreak of enteric fever, special reports have been prepared and submitted to the Town Council by Mr. Comber, the surveyor, and Mr. E. Pritchard, C.E. Dr. Parsons recommended that the Town Council should, with all practicable speed, procure an additional supply of water, free from all risk of pollution, and as soon as this could be accomplished discontinue the supply from the well at the sewage pumping station; maintain a careful guard against any conditions likely to cause pollution; remove all irregularities in the construction of the sewers, make provision for frequent and adequate flushing, prevent the discharge of heated liquids into the sewers as much as possible, provide openings at about every hundred yards to allow of a free passage of air, the severance of all air connection between house-drains and sewers, the management of the sewage farm so as not to cause a nuisance, the reconstruction of large or defective ash-pits on a smaller and more modern scale, the remodelling of the existing by-laws and the consideration of making others for dealing with offensive trades, the construction of a public abattoir and the closing of the more objectionable of the existing slaughter-houses, the replacement of middens so placed or constructed as to be a nuisance with some form of improved dry closet, and the making of arrangements whereby the medical officer could be promptly furnished with notice of deaths from infectious diseases.

The above are among the recommendations made by the Local Government Board inspector, and it will be seen that they involve an almost entire revolution in the sanitary arrangements of a town like Kidderminster, and the expenditure of a vast sum of money. Messrs. Pritchard and Comber also reported on the subject, and recommended the tubing of the well at the pumping station, the construction of another well, with additional pumping power, the covering-in of the existing reservoirs, and the construction of a high-level service reservoir, a constant supply of water, the prohibition of pig-keeping in the populous parts of the borough, the abolition of midden privies, and various matters connected with the flushing and ventilation of the sewers. It was proposed to carry these recommendations into effect by sinking a well through soft red sandstone of 10 feet diameter and 123 feet deep, with a borehole of 18-inch diameter and 377 feet deep,

making a total depth of about 500 feet, erecting machinery capable of raising 1,250 gallons per minute, conveying the water to covered reservoirs, whence it could be distributed in mains as required; by reconstructing the Park Lane sewer, which has in three instances a reverse fall, whilst in two other instances the inclination was not sufficient to allow the heavier matters to pass down freely; by reconstructing such portions of other sewers as are the least satisfactory, applying a system of open ventilation to the sewers throughout the town, and constructing 56 flushing tanks of 1,000 gallons holding capacity each, fitted with a self-acting discharging syphon, in various parts of the town. On February 12 a special meeting of the Town Council was held to take the whole matter into consideration. First came the report of the Drainage and Waterworks Committee, who stated that, after an interview with Mr. Pritchard as to the possibility of some of the more costly items being dispensed with without prejudicing the safety of the town and the health of the inhabitants, they had come to the conclusion that it was absolutely necessary the works advised by him should be carried out without delay. They therefore recommended that application be made at once to the Local Government Board for sanction to borrow 27,000*l.* for the carrying out of the work recommended; that a site be purchased for a reservoir; that Mr. Pritchard be employed as the solely responsible engineer of the works, at a remuneration of 5 per cent. upon the amount expended; and that an independent clerk of the works be engaged. The report was adopted. The sanitary committee at the same meeting recommended that notice be given to all owners of properties having privies and middens causing a nuisance in any part of the town on or about the level of the Horsefair to convert them into water-closets, and alter dustholes in accordance with a plan deposited in the borough surveyor's office; that all middens connected with privies in the higher parts of the town be filled up to within nine inches of the ground-level; and that all dustholes be roofed; also that the model by-laws of the Local Government Board respecting cleansing of footways, the regulation of common lodging and slaughter-houses, and with reference to offensive trades, be adopted. These recommendations were all agreed to.

SANITARY MATTERS IN AMERICA.

(FROM OUR OWN CORRESPONDENT.)

THE TENEMENT-HOUSE COMMISSION.

IN previous letters I have spoken of the Tenement-house Commission created by the State Legislature of New York to investigate and make a report upon the evils attending the tenement-house population. The report has at last been made public. It is estimated by the Commission that there are 26,000 tenements in New York city. The death-rate among tenement-house dwellers has risen from 51.11 in 1870 to 56.50 in 1884. This death-rate would be greater if so many cases of sickness were not removed immediately to the charity hospitals, to which institutions the deaths, when they occur, are credited. There is one district known as 'The Bend,' where the mortality of children under five years of age is 65.00. The Commission recommends that this block be cut through, extending from Leonard Street to Pell Street. If this is done, some of the worst tenement-buildings will be removed. They support this recommendation by citing the provisions of the Cowan and Cross Parliamentary Acts for the removal of buildings for sanitary purposes. It is in the rear tenements, of which there are 3,000, in which there is the greatest sickness. These should have additional yard-space, or should be removed.

The chief inspector attached to the Commission was Mr. Frederick Owen, a sanitary engineer, and the author of the supplement on American practice to the reprint of Parkes's 'Hygiene,' made by Wm. Wood & Co. Mr.

has made a supplementary report, in which he concludes as follows:—

There are buildings that should be ordered to be immediately vacated. The number needing an inspection of building is very large. It is impossible to make owners and tenants obey sanitary laws without strict systematic action. For this a larger force is necessary at the health department. Privy vaults in the city should be demmed, and replaced with water-closets rather than soil-sinks. All water-closets, vaults, and school-sinks tenement-house cellars should be removed. Cellars throughout lack care and attention. Waste of water deserves especial attention. The majority of bedrooms are without light and air. The darkness of halls conduces to immorality. The location of fire-escapes often exposes unnecessary danger. The condition of the tenements is generally in advance of the tenements, and they appreciate the importance of sanitary measures. Some of the worst tenements contain but three families. Rents are unnecessarily high. Illegal crowding is universal among the Irish Jews, the Italians, and the low Irish. Such, in brief, are the conclusions of the Commission. In accordance with the conclusions, a Bill has been introduced which attempts to correct these evils.

THE SANITARY COUNCIL OF THE MISSISSIPPI VALLEY. Second in importance to the American Public Health Association is the association known as the Sanitary Council of the Mississippi Valley. It was organised seven years ago by the banding together of all the State and municipal boards of health in those States liable to be affected by the presence of yellow fever in the valley, at a point. The most active officer has been the secretary, John H. Ranch, the secretary of the Illinois State Board of Health. It has always been a strong and influential organisation, having the confidence of the people, and plenty of money donated to them to work with. It held its seventh annual meeting at New Orleans on March 10 and 11. In view of a probable invasion of cholera, and the possible introduction of yellow fever, a committee was appointed to formulate a system of concerted action by States and municipalities represented in the council, to prevent the introduction of foreign epidemics, and their spread introduced. The chairman of the committee was Dr. R. C. Kedzie, of Michigan. The committee's report was the most important item of the proceedings, and was adopted as the report of the council. Quarantine by detention was declared to be a thing not now necessary save for the purpose of observing and purifying suspected vessels. In order to intelligently handle a vessel asking admission to the Mississippi River, its previous history must be known. In order to discover this, the Secretary of State, Washington, is requested to require from consular officers at ports from which vessels may clear for United States' ports, information in addition to the bill of health, which will permit the ante-clearing history of the vessel to be known to our quarantine officers. The Secretary of the Treasury is requested to station a revenue cutter off the mouth of the Mississippi River to prevent the entrance of infected ships. If an infected vessel enters the river the State Board of Health of Louisiana is responsible for its control and isolation until danger from it has passed. In order to secure confidence, each member of the council pledges that real or suspicious cases of yellow fever or cholera shall be immediately described to the balance of the council. In order that there may be no loophole for escape of responsibility in this matter, the symptoms indicative of yellow fever and cholera are given.

OFFENSIVE SMELLS FROM SEWER VENTILATORS.

THE report of Mr. Rogers Field, C.E., upon the condition of the sewers in the district of Bromley, Kent (January, 1885), will be found to be of such general

interest to all who are connected with sanitary work that we shall not hesitate to quote freely from it.

The drainage of this district has been designed upon the 'separate system,' and the soil drains consist of pipes laid in the modern manner with manholes or lampholes at every change of direction. The greater number of these manholes, and lampholes are provided with surface ventilating gratings, and other intermediate ventilated lampholes are freely used to increase the facilities for frequent supervision and to aid in the general ventilation.

It seems that complaints had been made pretty freely concerning offensive smells from these ventilating gratings. From time to time some of the gratings had been closed, and in a few instances ventilation-pipes from the drains (in lieu of these surface ventilators) had been carried up trees or buildings. The nuisance still continuing, the Board had very properly called in Mr. Rogers Field to examine into and report upon the cause of these bad smells, and to suggest the best means of removing them.

Mr. Field states that 'the most frequent causes of offensive smells from sewer ventilators are, according to my experience, defective sewers or house connections.' He, therefore, made a preliminary examination to see whether the nuisance could not at once be attributed to these causes. But not finding sufficient defects to account for the smells complained of, he instituted a very thorough and careful investigation of the whole system, embracing as it does about twenty-three miles of sewers. The sewers were found to be 12-inch pipe sewers, with in a few instances 9-inch pipes. The gradients of the sewers Mr. Field considers to be 'generally good, ranging for the most part from 1 in 50 to 1 in 150.' These sewers had been laid in straight lines from point to point, with the manholes, &c., that we have already referred to. Mr. Field's observations, which were carried out in great detail, consisted principally in flushing each drain at its head, and in watching 'the speed of the flush of water from manhole to manhole.' 'At the same time observations were made on what substances were washed along by the flush, so as to judge whether any deposit had taken place in the sewer.'

But the experiments were not confined to the public sewers. Many of the houses were entered by permission, and their drains and connections examined. As the result of his extended observations Mr. Field finds that many causes contribute in various degrees to produce the offensive odours complained of. In the first place, there were certain minor defects in the sewers, such as settlements in the channels of the manholes, which, by retaining decomposing sewage matter directly under the ventilating gratings, would tend materially to produce the nuisance objected to. Then defective house-connections were the cause of some trouble, as they in many instances admitted fine sand, &c., into the sewers, where it offered a serious impediment to the flow of sewage. Another defect was occasioned by an injudicious manner of flushing the sewers. 'In many places the flushing is effected by boards which are temporarily fixed in certain manholes so as to block up the outlet and cause the sewage to back up in the sewer above them. When the sewage has risen to a sufficient height the boards are suddenly withdrawn, and a rush of sewage takes place down the sewer and creates a flush. When the sewage is thus backed up it rises above and covers the benches of the manholes, and on the sewage receding when the flushing board is withdrawn the faecal matter which has been floating in the manholes is left stranded on the benches, just where its putrefaction would produce the evils complained of. On Mr. Field's suggestion this method of flushing (objectionable as it is for other reasons besides that alluded to) has been discontinued. The gravest difficulty in connection with the sewers is probably that occasioned by the fact that the sewers generally are too large for the work they have to do. It has been mentioned that nearly all the sewers are 12 inches in diameter. 'Such a statement as this of itself goes to show that either some of the sewers are too small or some

too large, as it is impossible that all the sewers can have the same amount of duty to perform. In the present case the 12-inch sewer, which has the greatest duty to perform, never runs more than a quarter full, and it is therefore evident that it is not too small. It follows, consequently, that a number of the sewers must be too large.' When it is remembered that the system of sewerage is extended to the outlying parts of the district it will be readily imagined that, the population being a good deal scattered, 'long lengths of sewers are frequently to be found in roads where there are no houses,' 'that in many cases during the greater part of the day the sewers are almost dry,' and that 'in many cases there are so few houses connected with the sewer that the greatest flow of water that takes place is not sufficient to force the solid matter along, and in such cases the sewage continues to accumulate until the sewer is artificially flushed.'

All sewers are liable to slight irregularities which matter but little when there is a strong flush of water, but when there is hardly enough water to move the solids along, it is manifest that the slightest irregularity will be of grave importance, as it will often retard the passage of sewage-matter, and sometimes even arrest it until it is forced on again by an extraordinary flush.

Mr. Field considers that this disproportion between the size of the sewer and its work is the principal defect in the system, and he is confirmed in that opinion 'by the fact that the few sewers which have a constant and appreciable flow of sewage in them are much less offensive than those which have little or no flow.'

The report continues, 'Many people would consider the fact of the pipes being larger than what is required no fault at all, but I cannot agree with this. Where the quantity of sewage is small, the larger the sewer is the less power the sewage has to force itself along, and *vice versa*. After making every allowance for future increase of population, there can be no question that smaller pipes would be amply sufficient for many of the sewers, and that they would considerably facilitate the passage of the sewage.'

Another objection taken by Mr. Field was that through various alterations to the manholes the ventilation had been diminished; as he says, 'The greater the extent of ventilation the more thorough will be the dilution and oxydisation of the gases in the sewers, and the less their offensiveness. This was well illustrated by a fact that was observed on several different occasions in the course of my investigation. A ventilator on the top of a manhole would be noticed as emitting an offensive smell, and on removing the manhole cover, so that a much freer ventilation was afforded, the smell would gradually diminish, and, after a time, practically cease. This seems to point to the fact that it would be advantageous to increase the ventilation.' The substance of Mr. Rogers Field's recommendations is that additional effective flushing of the sewers should be resorted to, that structural defects should be remedied, and that the utmost additional means of ventilation should be provided.

It must be gratifying to the Bromley Board to find that their sewage system has come out so well from Mr. Field's very searching investigations, and they, no doubt, will be eager to adopt his suggestions, which are carefully made in detail, and may then rely upon the extinction of those complaints which have been the occasion of their asking for this valuable report.

A NOVEL REMEDY FOR THE DRAINAGE DIFFICULTY.

It is probably unwise to speak of a *novel* remedy. To claim novelty for anything nowadays raises up at once a cloud of eager disputants, who are prepared, if need be, to go back to the Deluge to prove that the remedy in question, or something which they consider to be practically the same thing, has been proposed before. Of course no one can complain of this. Nothing is new in this world. But this eagerness to discredit the assumption

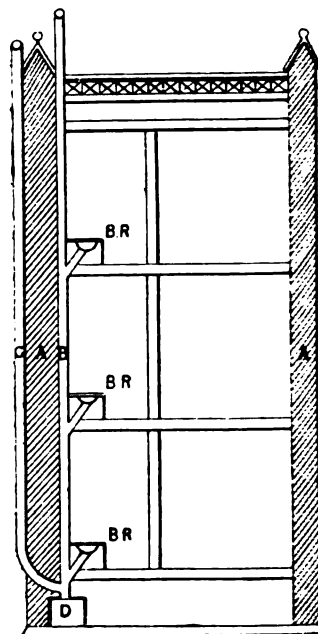
of novelty too often prevents people from fairly considering the proposition before them, whatever it may be. In our case this result may not so surely follow, as we do whether many will be ready to dispute our suggestion of this is practically a novel idea. We will let Mr. J. Walker, C.E., of Stirling, describe it in the words of his own circular which he has sent to us.

To the Queen and People of Great Britain.

The great object of this paper is to point out to who take an interest in the matter the sanitary state of this country at present. If the terrible pollution of the water and land now going on is not averted, the only result must be desolation and death. A good many years since Baron Liebig predicted that this would take place and he was in the habit of saying—'Those British ignorant people: they rob the land of the best manure and put it into the rivers—to poison themselves and their cattle.' Well, that was true then, and is true still, will only be cured by disseminating information among the inhabitants. Now, to give every reader of this paper a practical idea of how the present sanitary system is carried on, take any town of 10,000 people, divide the number by five, we then get 2,000 families. Now, each family will require 5,950 gallons of water in the week and all of it becomes liquid sewage—in twelve months 309,400 gallons. The whole of the 2,000 families pollute every twelve months 615,800,000 gallons, make it into liquid sewage, and there is little wonder that disease and death are in so many houses.

Now, to get rid of all these difficulties we must take this pure air system, and then we shall be in a position to do away altogether with traps, cesspools, and common sewers. There will then be no such thing as liquid sewage in any town, nor sewer-gas in any house.

The engraving shows houses for three families; there may be four or six rooms, each having their bath



room with the usual conveniences. A shows the wall, B the soil-pipe, and is common to all the houses. The top-end rises above the roof, while the lower end enters the air-tight receiver D at the base of the pipe, where the water is separated from the manure and gas to the drain. The soil-pipe is also joined to an air-pipe outside the wall, which keeps a continual current of air passing down the soil-pipe, and carries every atom

from the bath rooms. If every house was fitted as we should hear no more of sickness from it. Now, that every reader of this paper may see the great value of this invention, I will point out how it works. If we take the same number of families as at first, we find a difference. Each family uses only 30 gallons of water in the week, and 15 lbs. of manure. In twelve months, 1,560 gallons of water, and a ton of the best manure be secured for the town. The 2,000 families will use 3,120,000 gallons of water, and there will not be a pint of liquid sewage to be dealt with, besides leaving 2,000 tons of the best manure. Now, if Town Councils would consult with the tenant farmers in the locality to work this system out, it would be a blessing for all, in the first place, the towns would get rid of all liquid sewage; and, in the second place, the towns would be enabled to double the value of their land, and the manure for many purposes would require to be dried and sifted, that it might be riddled over the field in the month of February of each year, and the quantity of grass would be more than doubled. To show the farmer the great value of this manure, I will show the results of the experiments made by Baron Liebig and the Royal Agricultural Society, which I have before me. Twenty parts of land were prepared with cattle manure, and twenty parts in the same space were sown with household undiluted manure. Both were sown with wheat, and the outcome of the first was 11 bushels of gluten, while the second gave 35 bushels, the difference of gluten showing how the land has been robbed by the first. People say the farmers cannot live. Not so, if they are always taking out of the land, and putting anything into it; and I should say they are able to live. Now, if this important scheme were put into operation in every town on the banks of the six months they would be clean. Every town has its own work; all that is required is a large staff of men so that the people may understand the matter, and a model of the receiver and pipes. And, last of all, I would desire that our most Gracious Sovereign appoint one of her exalted councillors—a man of strong mind, and great moral courage—and the same power that Moses had to prevent every defiling the water. There must be no compromise; every house or houses must be fitted up according to this abomination may be swept off the earth. We have thought that it might interest some to have a position placed before them. Our readers will not fail to point to the serious objections that there are to this suggestion, and an enthusiast like Mr. Walker is, I think, beyond the reach of argument. It is, at least, a gratifying sign that an appreciation of the difficulty should be spreading among people who are hitherto but little technical knowledge upon the subject. *Ed. S.R.]*

A NEW MILITARY HOSPITAL.

Military authorities have exhibited during the past year the Horse Guards, a well-made model and plan of a large military hospital for one of our stations in the East, the exact locality, for prudential reasons, the moment withheld from the general public. It is sufficient, however, to state that the site is a beautiful insula, the principal stretches of water running round it, overlooking on one side a harbour, which instantly affords an ever-changing and interesting view. Further picturesqueness will be gained by planting a variety of shrubs in the long central avenue of the site. The special requirements of the uneven site have been carefully studied and successfully met by the Major-General Sir Andrew Clarke, of the Royal Artillery, and Mr. E. Ingress Bell, an architect of repute.

Beginning from the mainland from the east we find ample accommodation for the medical officers, and detached buildings assigned as follows: 'separation wards' for infectious cases, or those whom it is often for a variety of reasons desirable to withdraw from the general number, 'Prisoners,' 'Medical Staff Corps,' and 'Administration'—i.e. kitchens, stores, laboratory, &c. A covered way on the north of the main avenue affords a convenient method of reaching the blocks of wards, and at the same time shuts off the mortuary and various depressing surroundings.

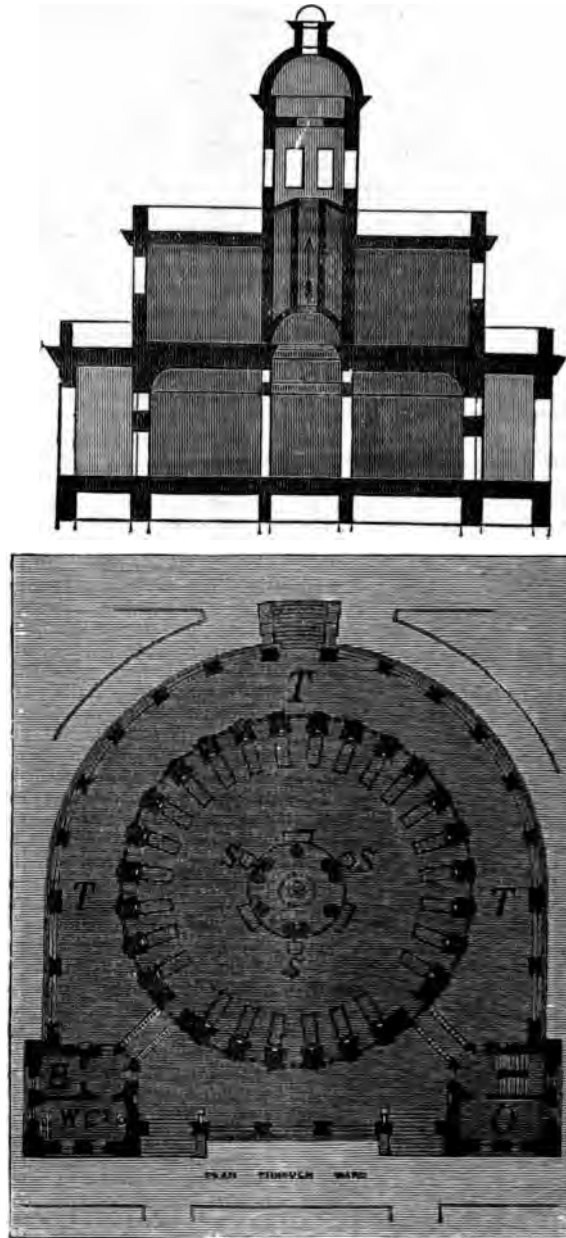
The wards, nine in number, are circular in shape, 66 feet in diameter, about 21 feet high, and 80 feet apart; each will contain twenty-six patients, making 300 in all, including the accommodation provided in the previously mentioned buildings. The liberal allowance of 2,600 cubic feet of air will thus be allowed to each patient, and we may mention that hitherto the minimum amount for hot climates has been fixed at 1,500 feet. The advantage of a circular ward is apparent when the ventilation is considered, as the vitiated air is drawn in a direct longitudinal direction from the bed to the centre of the building, there collected and carried up through a shaft about 6 feet in diameter in the dome, worked by a fan-extractor, whereas in a rectangular ward the air is drawn more or less diagonally across the room, and the exhalations from one patient may pass disagreeably close to or even directly across the bed of another.

Further advantages are claimed for the circular plan, as the circle encloses a larger area and cube than any figure of equal perimeter, and therefore will, with a given length of walling, accommodate the greatest number of patients, as the whole length of the enclosing wall, with the exception, of course, of the actual door openings, can be allotted to beds, whereas in a rectangular ward the two longer sides only are capable of such appropriation. The important question of aspect also can be more readily considered, and the exigencies of a site are more easily met, to say nothing of the larger amount of light and air between the wards themselves, thus conducing to the better ventilation of the entire space. In addition to the points mentioned, the full diameter of the ward may be exposed to, or defended from, any desirable or undesirable quarter of the compass, as the varying circumstances of the season or hour may dictate. We are inclined to agree, then, with the conclusion that the circular form is, in short, the logical result of attempts which have from time to time been made to improve the sanitary condition of wards of the ordinary construction by rounding off their internal angles. By degrees the quadrants have been struck with ever-increasing radii, and this proceeding strengthens the view that the ultimate solution of the problem lies in the adoption of the circular form. Bearing in mind the heat of the climate, various means have been considered to render the place comparatively cool when necessary, and with this view a fountain is placed in the centre of each ward under a suitable canopy, which cannot fail to be effective in appearance. The beds can be wheeled out into the verandah, which is formed by the arcade, and this arcade serves also to cut off the direct rays of the sun, no slight consideration. There is a storey or 'Baracca' above, on the principle of the Italian 'Belvedere' (for which Oriental precedent can be found before the Christian era); in times of emergency double the normal accommodation could be thus provided; and although this temporary space would not perhaps, be so sanitariously perfect as the lower half, the addition would doubtless at times be welcome. An instance of a sudden demand upon hospital resources may be noted at the present time in Egypt, where the total of sick and wounded in the British force is 500, including forty cases of sun-stroke and other effects of excessive heat and exhaustion; the base hospital providing accommodation for only 140 patients, the auxiliary hospital on Quarantine Island has been enlarged so as to hold another hundred beds, and in order to relieve the pressure on the medical department.

the *Pembroke Castle* has taken on board 200 cases *en route* for England.

The suggested use, therefore, of this upper portion is shown by the erection of a screen between the arches on the south side, from whence the unhealthy winds blow for a period of about three months in the year, the north-east and north-west winds mostly prevailing. There is an open

Attention is shown to the individual wants of less cases by providing a separate building of three floors containing on one floor a large reading-room, medicated below, and a chapel above; it goes without saying agencies of this description tend materially to hasten convalescence. The sea water for baths will receive a filtration through rocks. The drinking is drawn



Plan through Wards.
 T Covered Arcaded Terrace. B Bath-room. O Scullery and Orderlies' Room. S Stoves.

and hollow basement of rather less than six feet in height, so as to obtain a thorough current of air under the floor, and this height has been purposely arranged so that it is not sufficient to be afterwards converted into a habitable space, otherwise the temptation might prevail to occupy this area either for stores or hospital purposes.

source seven miles off through an aqueduct constructed 250 years ago. A further supply for domestic purposes will be obtained by utilising the rain-water from roofs, there being an average rainfall of 15 inches in the year.

The buildings generally will be warmed during the

gly cold weather by steam pipes, but supplemented by yard's stoves. The electric light will be used throughout, of course, the details in this respect are not yet ranged. A free Classical style of architecture has been opted, the materials to be used being stone and concrete, a decidedly satisfactory effect being given to a class structure which does not, as a rule, lend itself readily artistic influence.

LABOURERS' DWELLINGS IN WHITECHAPEL.

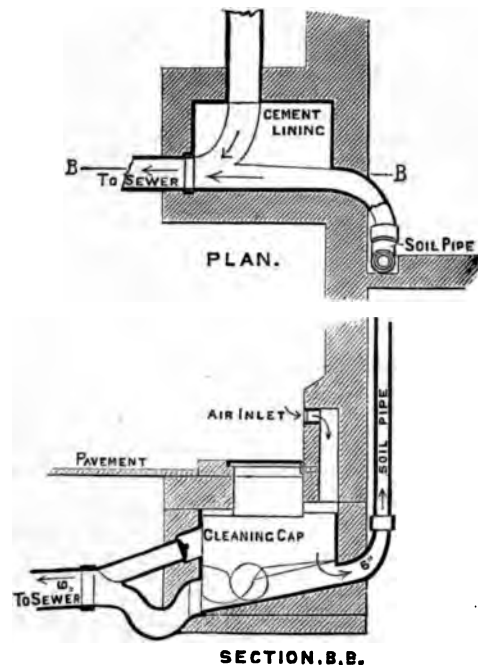
THE East End Dwellings Company have erected a large and interesting block of dwellings in Cartwright Street, Royal Mint Street, containing about 280 rooms intended for the lower working class or labourers. It appears that the site is a portion of a considerable quantity of land in that district cleared by the Metropolitan Board of Works, and contains 25,420 superficial feet, purchased for 3,650*l.*, which at twenty years' purchase means a ground rent of about one penny three-farthings per foot. This land, though cleared at the ratepayers' expense, was purchased at a price which scarcely represents its value if applied to other purposes, and it is less than the absolute cost to the ratepayers. The locality must, of course, be borne in mind, but as much as threepence and fourpence per foot sometimes paid for land for similar purposes in other situations—therefore an opportunity is here afforded of acting on very reasonable terms.

The buildings generally have been fully described and compared elsewhere; it is with the thoughtful system of sanitation that we are concerned for the present. Whilst due economy has throughout been exercised in the design and construction of this block, the work has not been needlessly cut down, value for the money has been found, and the important considerations of effectually disposing of the sanitary difficulties of a large building (or series of buildings) have been met with an unusual degree of success. In most of the dwellings provided for the upper working class it is usual to provide a water-closet and a sink and draw-off tap for each tenement or set of rooms; it is of course means considerable expense both in the first outlay and in subsequent repairs, but 'down East' such refinement has not yet proved to be requisite, consequently the latrines are placed together on the landings adjoining the staircases, with ample light and ventilation, as it is fully assumed that darkness and dirt go ever hand in hand, even under more favourable circumstances. Each separate latrine has therefore its own external window. The latrines, in sets of five, four, and six, are constructed on the trough system, they are made of concrete and lined with asphalt, so that the entire length is without a joint, the result being simplicity, soundness, and satisfaction. The three stacks of soil-pipes consist of five-inch cast-iron water-main pipes, carried up above the roof for ventilation, caulked with lead, and coated inside with Regus Smith's composition. It is worthy of remark that a part of the drainage system passes underneath the building, the soil-pipes of each block discharging into an inspection chamber (of which we give plan and section), which in each case is placed in a small forecourt or recess the company's property.

The water supply from the New River Company is constant, and is delivered into a 500-gallon cistern in the roof above each latrine space, there being one of Doulton's automatic flushing cisterns of 50 gallons to flush each set of closets on each floor; the New River Company, however, have sealed the ball-cocks, so that the amount of flushing power is not at present dependent upon the water at the buildings, but depends upon the decision of the water company, who maintain that waste is likely to be placed if discretionary power be placed in other hands. This point, however, is being discussed, and will probably be satisfactorily arranged.

The rain-water is conducted from the roof in the usual

way and assists in flushing the yard-drains and the inspection chambers. In reference to this it may be stated that it was intended to carry the rain-water from the feet of the front rain-water-pipes direct to the street gutter (as may often be seen elsewhere) in cast-iron channels sunk in the street pavement, and approval of a drainage plan showing this arrangement was obtained from the Metropolitan Board of Works; but the Whitechapel District Board of Works, claiming superior powers over the street pavements, determined to exert their powers, and refused to allow covered cast-iron rain-water-pipe channels to be carried in this case across the footway into the gutter. After considerable discussion, it was thought advisable to defer to the 'powers that be' rather than contest the question, and, at a small expenditure, carry the water into the inspection chambers aforesaid. Due provision is likewise made



for taking away the surface-water, and for draining the two detached wash-houses.

The water supply for domestic use is drawn direct from three rising mains, one of which passes up each staircase from the street mains. On each staircase landing is a 'Kilmarnock pattern' waste-not self-closing cock; under each of these cocks is a small sink, or rather drip-catcher, the short waste of which delivers into the trough of the adjoining latrines, the trough of the latrines being made the receptacle for the slops and dirty water which are usually thrown down the sink (tea-leaves and such-like are found to choke an ordinary sink-waste in a position like this), and the stout wooden seat of each latrine is strongly hinged as a flap to fold back when the latrine is being used as a slop-sink.

Adjoining the wash-house at each end of the back-yard is a urinal, also cleansed by a self-acting flushing tank, placed in the upper part of the wash-house. All the drains are laid in straight lines, with ventilating-pipes carried up from the head of each branch, with Doulton's trapped gulleys in the yard to receive the surface-water. Generally speaking, it may be said that the system is as complete as may be desired, and the East End Dwellings Company owe much to the architects, Messrs. Davis & Emanuel, for the way in which the various requirements have been fulfilled.

THE BUILDING TRADES' EXHIBITION AT THE AGRICULTURAL HALL.

THE sixth annual exhibition of materials and appliances appertaining to the building and kindred trades was opened at the Agricultural Hall, Islington, on March 16, and remained open for a fortnight. Though not quite so large in the point of number of exhibitors as one or two of its predecessors, it was decidedly superior to many in the extent and representative value of the exhibits. This was markedly noticeable in the case of several old supporters of the Exhibition, who availed themselves of the opportunity offered them of obtaining additional space, and filling it with some meritorious productions. Although, as always, there were a large number of exhibitors whose inventions have been fully described in the SANITARY RECORD on previous occasions, the Exhibition was not wanting in new inventors and inventions. Architects, builders, and all interested in house property have now learnt to look upon the Islington display as one where the best and newest materials and appliances are to be seen. It is in contemplation by the Executive to considerably enlarge the scope of the Exhibition next year, while still keeping it confined to its legitimate objects. The arrangement of the Exhibition devolved, as usual, upon Mr. Philip Shrapnel, who has been connected with these annual displays from their commencement, and was carried through with the most satisfactory results.

A good collection of Wood-working Machinery was on show, the exhibitors including Mr. E. H. Brown, Kingsbury Road, Ball's Pond, N.; Sagar & Co., Halifax; Lewis & Lewis, Cambridge Heath Road, E.; and W. Reynolds & Co., Edwards Street, Blackfriars Road, S.E.

Mr. E. S. Hindley, of Bourton, Dorset, and 11 Queen Victoria Street, E.C., who has secured a great amount of support for the manufacture of small portable engines, introduced by him at low prices, and of very attractive appearance, exhibited several of them of different power. A collection of very good wood-working machinery formed another section of the exhibit.

Joinery was in strong force, and included all kinds of machine-made woodwork used in house construction; that of foreign manufacture was rather extensively represented, the exhibitors being Duffy & Son, Stock's Road, S.E.; Andrews & Son, East Moulsey; S. Ransom, Kensal Road, Westbourne Park; and Esdaile & Co., Wenlock Basin, City Road, N.

Mr. Samuel Putney, Baltic Wharf, Harrow Road, Paddington, made an excellent display of his patent 'Pavodilos' Solid Wood Flooring, which has already been described in these columns. This mode of laying flooring, or floor borders, panels, dados, &c., is much to be commended, and is being largely used. It is admirably adapted for temporary purposes, as well as for permanent work; the rapidity with which it can be laid down or fixed being a great recommendation, coupled with the closeness of the joints. The different colours of the woods employed add a charm to the *ensemble* that can only be otherwise obtained by the adoption of parquet, which cannot be well employed for temporary purposes except at a considerable cost such as few persons would indulge in.

Messrs. Shrapnell & Bridger, 37 Walbrook, E.C., exhibited some excellent specimens of parquet flooring, both on their own account and as agents for Mr. Charles Steinitz, of Camberwell. The principal feature in the first-named examples was the superior manner in which the joints were made, causing squares of a much larger size than is generally attempted to appear of one piece, though composed of several slips. It is well known that architects object to specify parquet where the sections are beyond a certain size, for fear of the warping of the wood. The reporter has been shown specimens of this firm's work, made as described, that have been put to such severe tests as have satisfied critical minds with regard to their soundness and durability. This parquet flooring is

also offered at a lower price than any other. Specimens shown of Mr. Steinitz's make were of a character, the principal example being a floor of floral design composed of walnut and and purple wood, which evinced considerable as to design and finish.

Other exhibitors of parqueterie included Bassant, Wells Mews, Wells Street, W.; Brothers, 23 New Broad Street, E.C.; and Edner, 51 Clerkenwell Road, E.C.

Mosaic work was well represented by the Messrs. Diespeker & Co., 40 Holborn Viaduct. Their productions have received attention in these former occasions. They were by far the largest of their specimens showing considerable artistic comprising a wide range of subjects, suitable for floorings, but for all decorative purposes with material could be used. Attention was drawn to the low price at which a mosaic flooring could be obtained, enabling them to compete with the common tile, while offering a more durable article.

Mr. J. F. Ebner, 51 Clerkenwell Road, also showed some very good examples of mosaic work in glass.

Messrs. Maw & Co., Jackfield, Shropshire, to a choice collection of tiles, exhibited some specimens of mosaic, the prominent feature being decorative majolica and mosaic arranged as for the combination including D'Ors and Ruby gold, a really fine specimen of work.

Imitations of mosaic were also shown by Mycenian Marble Co., 6 Bunhill Row, the artist imitating embracing chimney-pieces, columns, pediments for various classes of buildings, and other all of which were of attractive character and low price.

Specimens of stone were well to the front, Messrs. & Sons, of High Wycombe, showing some good from their quarries in Bucks; the Mangotsfield Stone Co., Limited, having some bold examples of well-known material, which has been mentioned to former exhibitions. A general collection of paving, and road stones was sent by Samuel & Sons, Millwall; and Painswick stone, from Barnet Stroud, was shown by Mr. Isaac Gardiner & Sons. The celebrated Bath stone, of different hardness, was sent by Messrs. Pictor & Sons from their quarries at Box, Stoke, Corsham & Farleigh Down, their competitors being Messrs. Brothers, from the same neighbourhoods. The included columns, panels, cornices, blocks, and objects.

Of bricks and brick ornament there was a good display. Messrs. Thomas Lawrence & Son, Brackley, generally make a point at these exhibitions of specimen of their productions erected to represent recently built or about to be executed. On this occasion they exhibited a carved and moulded red-brick way, with a handsome oak door, the work having been executed by Messrs. Cubitt & Co. as the entrance villa residence in the country. It was an excellent workmanship, and exhibited their well-known facing bricks to advantage. The bricks made use of are of three colours—a rich orange red, bright and rich dark red. Samples of house and wall cream, strawberry, and red—were also shown.

As a set-off to the last-named, a somewhat more elaborate erection, but on a rather larger scale, in cream and moulded bricks, was shown by Messrs. Wright, East Acton Brick Works, W., and elicited considerable approbation.

Other well-known firms exhibiting bricks of various colours, &c., were the Woolpit Brick and Tile Works, Suffolk; the Rowlands Castle Brick Works, 49 Finsbury Pavement, E.C.; the Danton & Sons, Red-brick, and Tile Works, Sevenoaks; the

Plain Pottery Company, Limited, Cobridge, Stoke-
rent; (Vitreous-faced), Bacon & Co., Midland Rail-
N.W.; Muldoon Brothers, Roman Road, Barnsbury,
in addition exhibited specimens of asphalt and wood
-paving, &c.; E. Plowman, Lower Gravenhurst,
Amphill, Beds; and by Rosher & Co., Upper
nd Street, Blackfriars, in combination with artificial
garden furniture, &c.

ist of the specialities in roofing tiles were exhibited.
J. Matthews, of Weston-super-Mare, in addition to a
e collection of garden vases and other floral articles
ble for in and outdoor use, for which he has estab-
l a well-earned reputation, exhibited Poole's Patent
ing Roll Square-cornered Roofing Tiles, of which he
aker. They are well made, and are claimed to be
against wind-stripping and rain-drifting. Mr.
ps, of Monmouth, was as usual present with his
it Lock-jaw Tiles; and Mr. Henry Hall, F.R.I.B.A.,
hty Street, W.C., exhibited his Patent 'Hanging'
all Tiles, adapted for facing old or new walls, rough
ings, or for fixing to fireproof-work of iron and con-

They are of attractive appearance, can be supplied
ferent colours, also with patterns stamped on them
relief. They are easily fixed, will not fall off, and
puted impervious to damp, fire, or frost.

e newest invented tiles for roofing purposes were
y Messrs. H. J. & C. Major, of the Patent
Works, Bridgwater. In the SANITARY RECORD
ay 1884 a description was given of the works of this
firm, the first founded in Bridgwater for the manu-
e of tiles, and now some 250 years old. The
restshire town has gained a reputation for roofing
hat no other can aspire to, and so popular has the
become in connection with these articles that we
t adopted by some makers in other parts of the
ry; but, if imitation is the sincerest form of flattery,
case it is not altogether appreciated by Bridgwater

mostly for London Vestries and the Board of Works. Its
cost is some 15 per cent. less than York stone, and its
fine, even, and close texture is generally admired.

W. H. Lascelles & Co., Bunhill Row, sent amongst
other specimens of their concrete, a massive bay window,
and a porch in red, made for the Victoria Mansions,
Westminster, for Messrs. Perry & Co., builders, Bow,
from designs furnished by Mr. Basset Keeling. They
likewise exhibited some excellent joinery work, of which
a prominent feature was a wainscoat door with raised
panels, and an 'overhead' for the same, designed by
Mr. H. Encan Rumble, Eastbourne.

Curzon's 'Impervious' Concrete Paving, *in situ* and in
slabs, was exhibited by the company taking that name,
of Westminster Chambers, S.W. This material is used
for all paving purposes, including stables, cowhouses,
&c., and is hard, durable, and altogether commendable.
Patent slate bricks for engineering and other purposes
were also shown, claimed to be harder than the Blue
Staffordshire variety.

Mr. S. D. Pochin, of Millwall, was present with
samples of his adamantine concrete building stones, plinths,
quoins, &c., also flagging, granite kerbs, &c., formed of
very hard and durable material of good appearance.

The Imperial Stone Company, Limited, East Green-
wich, were also well represented. A leading feature
with this Company is Silicated Stone Sewer and Water-
pipes, the latter made to a large diameter, combining
great strength with sanitary requirements.

Wilkes's Metallic Flooring and Eureka Company,
Limited, Devonshire Square, E.C., sent a variety of
articles to which their material is applicable, including
every purpose for which natural stone is utilised.
Amongst the examples were some very creditable figure
castings in concrete, and samples of stable paving as laid
down at Marlborough House for H.R.H. the Prince of
Wales.



s. The tiles in question, of which we append illus-
trations, are of the 'locking' type, and each one is pro-
vided with a 'rib' or 'web' across the face of the upper or
lower tile, and a corresponding one underneath the lower
tile. There is in addition a secure lap formed of deep
grooves at the side; thus every part is amply protected and
perfectly secure against the entrance of snow or rain,
drifting by wind. They may also fairly be claimed
non-porous, which they undoubtedly are. Each tile
is subjected to a pressure of sixty tons, which not only
brings the atoms together to such an extent as to cause
water to run off as fast as it falls upon them, but it produces
a gloss upon the tile which gives them a superior
appearance to all others. The patent can be applied to
ridge-water tiles, and the demand has become so
great that the firm are now working on the patented
tiles to the full extent of their capabilities.

Principal houses which have made specialities of
manufacture of artificial stone, concrete, and similar
materials, were well represented. The Patent Victoria

Company, Kingsland Road, showed examples of
production in the form of staircases, ornamental
fountains, sinks, cut specimens, and their noted paving
tiles. It is stated that as much as eighty miles in length
of paving has been laid during the last sixteen years,

An adamantine clinker of buff colour in small oblong
blocks for paving stables, &c., extremely hard, was
shown by Messrs. Towers & Williamson, of Little
Bytham, Stamford.

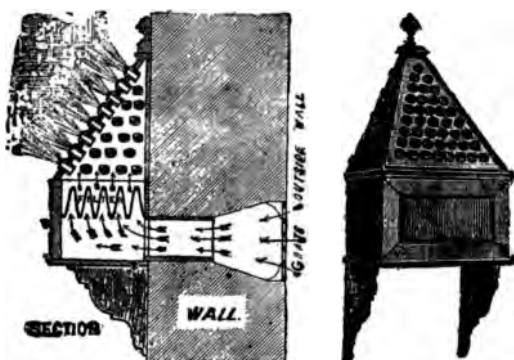
The various Paint Companies who claim especial
features in their productions, most of whom have been
mentioned in the SANITARY RECORD on prior occasions,
were represented. Amongst them were the Indestructible
Paint Co. (Browning's Patent), Cannon Street, E.C. The
Invisible Preservative (colourless) solution made by this
Company for protecting work from the action of the
atmosphere, was selected for coating Cleopatra's Needle
when that monument was erected on the Thames Embank-
ment. It was recently stated by Dr. Bartlett, who ex-
amined the Obelisk so late as last November, that he
believes no other solution with which he is familiar would
have proved so effective, and that the Obelisk is at the
present moment sounder than when the solution was first
applied.

Amongst the other firms exhibiting paints and damp-
proof solutions were the Silicate Zopissa Co., A. Leete
& Co., London Road, Southwark, H. Thompson & Co.
(Magnetic Oxide), Merrow Street, Walworth, and Robert
Morgan & Son (Economical), 217 Blackfriars Road, S.E.
In paper-hangings Messrs. Woollams & Co., 110

High Street, Manchester Square, W., as usual made a most artistic display, a natural consequence of the fact that some of the best designers of the day are from time to time pressed into the service of this enterprising firm. Messrs. Woollams again proved their power of producing the most elegant designs in all shades of colour without using noxious pigments, every specimen of paper exhibited being free from arsenic and otherwise innocuous. The patterns of the papers comprised damasks both in blocks and water colours, on plain and mica grounds, dado decorations, and friezes in Italian, Genoese, Indian, Japanese, and English designs, the blending of colours in many of the examples being very well carried out.

Messrs. F. Walton & Co., Limited, Sunbury-on-Thames, exhibited numerous specimens of their popular decorative material, 'Lincrusta Walton,' to which was awarded a Gold Medal at the recent International Health Exhibition at South Kensington.

The Harding Ventilator Company, of East Parade, Leeds, whose patent air diffuser was fully explained in the *SANITARY RECORD* of February 15, in the report of the Leeds Exhibition, exhibited their principal appliances for the admission of fresh air without draught. Without now going into a detailed description of all their specialities, attention may be directed to the ingenious mode employed in casements, illustrated below. The fresh air is first admitted into a chamber from the outer atmosphere, and has then to pass through a number of glass tubes before it enters the building, by which means it is divided into small streams before mixing with the interior atmosphere.



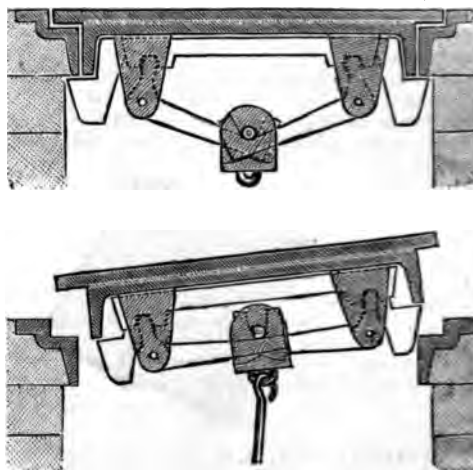
For dwelling rooms, or where necessary, the fresh air is made to pass through a series of fine silk gauze filters, that can be taken out for cleansing at any time. This method has the effect of cleansing the incoming air, a most essential feature, and possesses the further advantage of arresting the too rapid passage of the air, preventing all feeling of draught or sensation of chill. The room ventilators can be made of the most ornamental character, and their intention may be concealed to a great extent, thus preventing any peculiar appearance in the room so ventilated.

The Cambrian Chemical Company, Limited, 110 Cannon Street, E.C., exhibited for the first time at this Exhibition their Patent Cambrian Metallic Red Paint, claimed to be anti-corrosive and indestructible. It is particularly recommended for all outdoor work, either for wood or iron, and, judging from the testimonials in possession of the Company, is highly esteemed by those who have made trial of it. It is made in the neighbourhood of Pontypool, from copperas or green sulphate, from which by the patented process adopted, the sulphurous acid is thrown off, leaving a pure pigment as the residue. It gives a smooth and glossy surface to either wood or metal, has considerable covering power and lasting properties; and has been proved to be well-adapted to the London atmosphere. It is put up in small tins for private use, as well as in bulk for large consumers.

A large collection of Fibrous Plaster, Carton Pierre, &c., was on show, but presented no novel feature.

Hitchins' Fire-Proof Plastering Company, Limited, 1 Gresham Buildings, Basinghall Street, E.C., had a half-timbered building, of pleasing appearance, showing the method of fixing this valuable material, which is adapted both for internal and external use. It is supplied in slabs that are readily fixed, and the composition is of such a character that it is not only fire-proof, but is of such a nature that it is almost impossible for a ceiling covered with it to fall, even if covered with water.

Messrs. Hayward Bros. & Eckstein, Union Street, Borough, S.E., contributed a noteworthy collection of exhibits, comprising a variety of appliances essential in the construction of all buildings claiming in any sense to be designed on sanitary principles. The appliances shown, which are all manufactured by the firm themselves, comprised their well-known Patent Semi-prism Reflecting Lens Pavement Lights; Illuminating Lights, for cellar, subways, and various other uses; Hayward's Sheringham Inlet Ventilator; Improved Mica Outlet Ventilator; Silk Flap Ventilators, for prevention of down-draught in air-extracting shafts; Hayward's Venetian or Louvre Inlet and Outlet Ventilators; Fresh Air Mica Inlet Valves, for ventilating drains; Revolving Archimedean Screw Ventilator; Air-tight Inspection Cover for Drains; Improved Circular Iron Staircase, with tread, riser, and spandril in one; lastly, a very simple but very essential appliance in the shape of a Self-



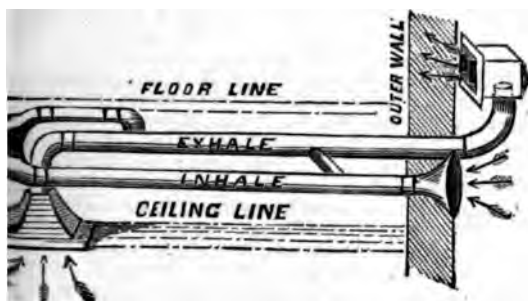
locking Coal-plate. The two illustrations given of it in its respective positions of fixture and removal clearly demonstrate its automatic action. It consists of a protecting ring fixed in the pavement into which the self-locking coal-plate is dropped and immediately secured or locked by the projecting bolts on each side. It cannot by any possibility be removed from the outside, while it is immediately released from the inside by pushing up the weighted lever. It is sincerely hoped this safety coal-plate will be widely adopted, and so lessen the number of accidents occurring through carelessly fastened coal-plates.

Mr. Thaddeus Hyatt, 9 Farringdon Road, E.C., also exhibited a variety of Prismatic Pavement Lights, and lenses suitable for all kinds of flooring, areas, stall boards, &c. A bull's-eye pattern was shown, strong enough to bear the traffic of horses and carts. A pretty arrangement was exhibited comprising encaustic tiles and glass lenses suitable for halls of private houses. Mr. Hyatt is the patentee of this combination.

The leading firms of ventilating engineers were well represented, Messrs. Robert Boyle & Son, Holborn Viaduct and Glasgow, occupying a prominent position.

Their exhibits comprised a variety of examples of their patent Self-acting Air-pump Ventilators, several very well-designed turrets being conspicuous. Ridge Ventilators, oil-pipe Ventilators and Cows, Ship Ventilators, for which the firm hold the gold medal awarded by the Shipwrights' Company, their patent Air Warmer, for supplying warmed fresh air to rooms and public buildings, and their complete and economic system of ventilating workmen's cottages were amongst the exhibits, which altogether numbered eighty articles, making it by far the most extensive collection of ventilating appliances in the Hall.

Messrs. Edgar Aldous & Son, Elmshurst, Upton Lane, Forest Gate, exhibited their system of ventilation, which has been fully described in the columns of the *SANITARY RECORD*. The ingenious arrangement adopted by the Messrs. Aldous in their 'Extractor,' of utilising a down-draught to form an up-current, has been proved to be most effective. To meet the demand existing for a simple mode of ventilating a single apartment by drawing off the vitiated air without the use of unsightly appliances, the firm have recently patented a ceiling-ventilator which combines the principle of their turret exhaust as applied to an entire building. An illustration of the invention is appended. It is intended to be fixed between the ceiling and the flooring of the room above. Presuming that the centre ornament in the ceiling is pierced to allow the vitiated air to pass out, it is drawn into the 'bonnet' to be



fixed on a level with the ceiling, and takes the direction of the exhale-pipe, and is carried outside the wall, where it escapes through the square box opening fixed a few inches from the wall. The better to effect the exit of the vitiated air an inhaler-pipe is provided, and by means of the trumpet-shaped opening covered with a perforated metal draws in fresh air, which is carried along to the bend, and enters the exhale-pipe, thus producing an additional current, and passing off with the heated atmosphere. The pipes, which are all on a level or parallel with each other, only require to be made the necessary length, and the appliance can be easily fixed by removing the flooring-boards of the room overhead. This ventilator is inexpensive, automatic in action, free from down-draught, and will remain perfect so long as the material lasts.

Messrs. Kite & Co., Chalton Road, N.W., made a good display of their well-known Ventilating Appliances, illustrated by some interesting models showing their working. Like the last-named firm, Messrs. Kite's appliances have been fully described in the *SANITARY RECORD* on former occasions. One of the prettiest articles in connection with the ventilation of rooms shown at this Exhibition was an elegant Wall Cabinet, for erecting on a chimney-breast, as an outlet ventilator, so arranged that no loose parts are connected with it to make an unpleasant noise, so common in chimney-breast ventilators.

Messrs. Smith & Stevens, Leicester Square, in addition to some well-devised Locks and Lock Furniture, exhibited their Patent Door Springs and Checks, and Gilmore & Clark's ventilating appliances, one of which, the 'Autothermarkon,' is of the automatic character, opening and closing as the temperature of the room rises or falls.

The collection of grates, stoves, kitchen-ranges, and

heating apparatus left nothing to be desired so far as excellence of design and finish were concerned.

The principal display was made by Messrs. Yates, Haywood, & Co., who occupied the larger portion of the east end of the hall, the wall being faced with a row of Mantels and Over-mantels in cast iron, wood, marble, and slate, supplemented with Grates, Tile Hearths, and the usual appendages of the fireplace. The designs comprised examples of the Early English, Adams, and Queen Anne styles, many of them being of an artistic character. The firm have entered with considerable spirit into the manufacture of cast-iron over-mantels, and are second to none in their designs and colouring. The exhibit also contained a variety of hot-air and other stoves, kitchen ranges, and other articles in cast iron of their manufacture.

Messrs. George Wright & Co., Rotherham, and Queen Victoria Street, E.C., had a smaller but exceedingly good exhibit of a similar character, amongst which we noticed the old 'Bivalve' Grate, originally invented by Mr. Wright. It is now made as either a slow or quick combustion grate and named the 'Interchangeable,' giving perfect control over the draught.

Mr. James B. Petter, of Yeovil, was also present with his popular Nautilus Grate, which, at our hands, has already received the high meed of praise to which it is justly entitled.

Mr. T. J. Constantine, of Fleet Street, exhibited his valuable and widely known 'Treasure Range' and economic cooking appliances. The Wilson Engineering Company had a stand with the Ranges associated with their name. The Eagle Range Company contributed their speciality. American pattern stoves and ranges were sent by Messrs. Smith & Wellstood, of Ludgate Circus, and Messrs. Poore & Co., of Cheapside. Gas-cooking and heating stoves were exhibited by Messrs. H. & C. Davis & Co., Camberwell, A. J. West & Co., Lisle Street, Leicester Square, and Messrs. Wilson & Son, Leeds.

Mr. Renton Gibbs, Mill Street, Liverpool, had a working model of the heating apparatus made by him for so many years past. Its capacity for adaptation is almost universal, and has been applied to Turkish baths, for drying clothes, bricks and pottery, and for churches, private houses, &c.

Messrs. Deane & Co., London Bridge, as the London agents of Mr. Fletcher, of Warrington, had a stand containing that gentleman's excellent inventions in cooking and heating stoves, bath and water heaters, &c., including many articles for laboratory use heated by gas, such as muffles, furnaces for crucibles, blowpipes, forges, &c.

Mr. Harry Hunt, Palace Works, Newington Green, N., who was the first to introduce into England Canadian heating stoves burning anthracite, under the name of the Crown Jewel, exhibited a notable collection of these economical and excellent heating appliances. Latterly the designs of these stoves have been very much improved and made more in accordance with English taste. One of the new ones, named the 'Argus,' a base burner like the Crown Jewel, holds sufficient fuel, either coke or anthracite coal, to burn from thirty-six to forty-two hours, a length of time unparalleled in stove burning. As a hall-stove, if kept burning continuously through the winter months, which can be done with perfect safety, the cost of fuel will not exceed a few pence per diem, and the temperature can be regulated to any requirement. The value of keeping the house at something near an equable temperature during cold weather is now generally admitted, and no better appliance for burning coal or coke than the Canadian stoves can be obtained. Mr. Hunt also exhibited a valuable improvement for kitchen ranges, which can be attached to any existing kitchener without taking it out. It is an arrangement for reducing or enlarging the fire at will, forming an economical appliance, and one calculated to assist the cook in an emergency. It consists of a means of lifting the fire towards the hot plate, and takes the form of a box

fixed in the brickwork at the back of the ash-pan. The few appliances now in use for this purpose rise in a somewhat semicircular form, but in Mr. Hunt's invention, by depressing a lever, the fire is made to rise in a completely vertical position, causing the heat to be equably distributed, and enabling work to be done with a very small consumption of fuel. It has also the advantage, when raised, of preventing the cold air from passing over the top of the fire and cooling the flues. It will be found an invaluable addition to the ordinary kitchen.

Several makers of electric house and other bells, and burglar alarms, exhibited a very creditable collection of their inventions. Messrs. Eck, Callow, & Co., Dean Street, Holborn, exhibited Brown's patent automatic indicating and testing fire-alarm, of which they are the sole makers for the United Kingdom. In the event of a fire occurring in a building fitted with electric bells to which this appliance is attached, an alarm is quickly sounded. The fire alarm consists of a thin ribbon of metal that fuses at a very low temperature, and so sets the entire range of bells ringing. It may also be fitted to actuate any kind of external alarm, and, in combination with Brown & Saunders' single wire fire alarm telegraph, may be arranged to transmit the alarm and locality of a fire to the nearest station, an advantage of considerable importance. Harrison's patent burglar alarm, another form of electrical apparatus shown by the firm, appears to be a valuable indicator of the burglar's whereabouts. It is fixed outside a building as near to the top as possible, and connected with all accessible windows or doors. Immediately on the opening of either the circuit is made complete, a loud report ensues, and a powerful light is simultaneously ignited, which burns for a considerable time, showing the house where the attempt has been made, and presenting a chance of securing the culprit, whose nerves, by-the-by, would probably be rather upset by so unlooked-for a light on the subject. Mr. Julius Sax, Great Russell Street, W.C., one of the earliest makers of electrical appliances, contributed an excellent collection, including house bells, burglar, and fire alarms, lightning-conductors, and watchmen's clocks.

Mr. Geo. Porter, Cullum Street, E.C., also a well-known manufacturer, exhibited his system, which includes the pneumatic and electric in combination, every push being separately connected to the indicator by a small metal tube. Mr. Porter's indicators are very substantial instruments, and require a much less amount of battery power than has usually to be employed, while the bells ring effectively irrespective of distance.

Mr. William Pressland, High Street, Stoke Newington, had a collection of electric bells, including examples suitable for railways and mines, invalid sets, lightning conductors, galvanometers, &c.

Messrs. Gretton, Mynn, & Co., Grocers' Hall Court, E.C., supplied incandescent electric lights to the exhibitors, the Benson and Grubbe dynamo being the apparatus used.

Galvanised iron tanks for domestic and other uses were shown by the old-established firms of Burney & Co., Millwall Docks, E., who are makers to the Royal Navy, and Crouch & Jay, Maroon Street, E.

Specialities in locks formed another feature of interest, one of the most notable being the patent 'Springless' latch-bolt locks exhibited by Messrs. Chas. D. Douglas & Co., Queenhithe, Upper Thames Street, E.C. In these locks the latch-bolt is worked by means of a metal block poised in such a manner that one of its edges carrying the entire weight rests upon the 'follower,' and is brought into action immediately the handle is turned, taking the place of the ordinary spring, and the handle may be turned to left or right with equal facility. The advantages of this principle are so apparent that it must recommend itself to all buyers of locks. The action is more easy than that of the spring, there is nothing to become deranged in use, consequently there is not anything to interfere with the free play of the latch-bolt, which cannot by any means 'stick' or refuse to move.

To this action the firm have recently applied the 'push' and 'pull' movement, making four actions for actuating the bolt. This combined application is the most perfect mode of opening or closing a door extant. Messrs. Douglas & Co. also exhibited an improved mode of securing the knob on the lock-spindle, that constant source of trouble in a house. This invention seems to render it impossible that a knob should become loose or fall off. Another improvement shown by the firm was a lock and latch for a railway-carriage door, which, by one pressure, and that of the gentlest character, latches and locks the door securely. The interior construction of this lock is simple, but ingenious, and cannot fail to effect its purpose. It has already received the approbation of one of the largest railway companies, and wherever adopted will be received as a boon by travellers.

Mr. F. T. Biggs, Leadenhall Buildings, E.C., exhibited his patent tubular lock, which has a ball latch, enabling the door to be opened by a 'push' or 'pull,' the furniture being fixed on the door and not attached to the lock. A patent spring door hinge of an ingenious character was also on view at this stand.

Messrs. Joseph Kaye & Sons, 63 High Holborn, one of the first makers to introduce the 'push' and 'pull' lock, exhibited a variety of examples of their specialities, the principle being shown in many different applications, even to latching drawers on board ship.

Other exhibitors of locks and their appendages were Messrs. Chubb & Sons, Queen Victoria Street, E.C., whose collection showed very fine finish, and also included locks on the push and pull principle, a plan evidently progressing in public favour; Broughton & Co., Queen Victoria Street, including the Chelsea patent reversible centre-bit mortise; Mr. R. Adams, Great Dover Street, who also had his usual collection of fanlight openers, reversible windows, spring hinges, &c.; Mr. Alfred Gill, 9 Arthur Street West, E.C., &c.

Improvements in the construction of windows were also exhibited by Mr. J. D. Tucker, Bromley, Kent, in the form of weather-tight sashes; Mr. Harry Pearce, Great Portland Street, W., as agent for Messrs. W. & R. Leggott, Bradford; simple mode of opening and closing fanlights, skylights, &c.; Messrs. Meakin & Co., Baker Street, W., locking windows, reversible sashes, &c.; Pennycook & Co., Ironmonger Row, St. Luke's, fanlight openers; and Mr. M. Williams, Frodsham, & Co., Chester, improved metallic casements.

The imitations of various marbles in enamelled slate for chimney-pieces, &c., were well set forth by Messrs. Sessions & Sons, of Gloucester, a firm which has taken a leading position in relation to decorative slate articles generally, as well as in the different sanitary appliances to which this material is applicable. Enamelled slate urinals were exhibited, facsimiles of those supplied by the firm to a number of noted public buildings and railways, and which have been largely exported to Australia and foreign countries. The exhibit also included baths, sinks, wall-linings, and other decorative articles of an interesting character. Messrs. Muldoon Brothers, Roman Road, Barnsbury, had also a good collection of slate goods.

Sanitary appliances formed a conspicuous feature in the Exhibition. Messrs. Shanks & Co., Cannon Street and Glasgow, made a good show of their manufactures, but nothing new, and the same remark may apply to Messrs. Capper, Son, & Co., Ingram Court, Fenchurch Street; Brazier & Son, Blackfriars Road, S.E.; Bolding & Son, South Molton Street, W.; and John Smeaton, Imperial Buildings, Ludgate Circus. Stanford's Patent Joint for stoneware pipes was shown by Mr. H. Ough, of Ascham, E.C.

Moule's Patent Earth Closet Company, Garrick Street, Covent Garden, made a fully representative display of their various pattern closets, on which it is unnecessary to make further comment.

Messrs. Ewart & Son, 346 Easton Road, did not exhibit anything particularly novel, but many objects of

ve character. Their stand contained specimens everything in the shape of their manufactures and decorative zinc work. The display included Roman baths, the Zenobia, and Moncrieff baths, and others of a cheaper character, their Califont 'or instantaneous waterheater; a variety of conservatories and flower-boxes and their smoke curers, known by the name of the and Prince. The decorative zinc work for roof ornamentation of buildings was of the most varied illustrating how cheaply and effectively this can be utilised for such purposes.

Julius Muller, Dashwood House, New Broad Street, E.C., exhibited an ingenious invention made at Aachen on the Rhine, for fixing under the cover-boards, and under floors in heating and drying rooms, ice cellars, &c. It is made in the form of slabs of small pieces of cork cemented together. The bricks are very light, and besides being good conductors for heat or cold, are well adapted for sound. A small house was exhibited, built of the material with the addition of a few wood

Patent cork mouldings for steam and hot-water pipes, &c., were also shown, and a fire-proof non-conducting material supplied in a dry powder. This is to be applied to any kind of pipe or flue passing water, or superheated steam. It is said to adhere firmly, and to resist all external influences.

F. Orme & Co., St. Andrew Street, E.C., sent a valuable collection of wood and metal working machines, including drilling machines, saw benches, machines, tire benders, lathes, &c. Many of the were of American manufacture, and were fine specimens of workmanship and finish. Pumps of America were also conspicuous, a notable one being a rotary pump for steamboats, mines, &c.

J. Hopkinson & Co., Huddersfield, exhibited a collapsible hot-water cylinder for baths and hot-water appliances. This cylinder is formed of corrugations, producing immense strength, preventing the unsightly bulging or collapsing that occurs in cylinders made of plain sheet metal, and consequently able to withstand a much greater pressure.

Willesden Paper Co., 34 Cannon-street, E.C., and others, were present with specimens of the various materials which their material is adaptable. It has been adopted by Government for the Egyptian pyramids. Amongst the most notable articles shown was a wheel, the buckets being made entirely of the same material, intended to hold a water-tank of the same material, intended to be its waterproof qualities.

An excellent assortment of draining and other levels, staves, and other scientific instruments were shown by Joseph Davis & Co., 6 Kennington-park-road, including a large collection of their Fitzroy barometers, which note has been taken on several previous occasions.

Pancras Iron Works, Pancras-road, N.W., sent a collection of stable, cowhouse, and piggery fittings, and manufactures to which they have given much thought, and for the excellence of which they are universally admitted to compare favourably with their competitors. Not less noteworthy were the examples of forged ironwork forming part of this display.

Hodkinson & Clarke, Limited, Small Heath, Birmingham, whose specialities have often been described in the SANITARY RECORD, contributed their usual quota of window shutters, window blinds, stained and painted woods, &c., exhibited through the medium of the section that always forms a conspicuous feature at exhibitions.

London Patent Automatic Disinfectant Company, 1 Victoria Street, E.C., exhibited their excellent apparatus for attaching to any kind of water-closet or for the automatic discharge of a disinfectant every

time the apparatus is used. Although this apparatus has been fully described in the SANITARY RECORD on a prior occasion, we make no apology for reverting to it again.



Illustrations of it are appended, fixed to a closet, and not fitted. Small as the appliance is, it will hold sufficient disinfectant for 10,000 gallons of water. It is easily fixed, inexpensive, and may be removed by a tenant should change of residence supervene.

Mr. C. G. Roberts, Haslemere, Surrey, exhibited his Patent Rain-water Separator, an invention of considerable value, particularly in country districts, where rain-water forms such an important item in domestic water supply. This apparatus has also received detailed description at our hands when shown at former exhibitions.

A very useful invention, consisting of metal laths to take the place of the ordinary wooden ones for ceilings and partitions, was shown by Mr. G. M. Edwards, 54 Gresham Street, E.C., also dove-tailed corrugated iron sheets for use in combination with Portland cement for fire-resisting floors, partitions, &c. These inventions deserve high commendation and universal adoption.

Messrs. Groom & Co., Clerkenwell Road, commanded considerable attention for the many excellent domestic culinary articles shown on their stand, including their popular potato steamer, shown in action. At the National Health Society's Exhibition held at Humphreys Hall in June 1883, a diploma was awarded to it, and it has since received other commendations and medals. As a cooker of potatoes it stands unrivalled.

Mr. P. A. Maignen, 32 St. Mary-at-Hill, Eastcheap, had a stand containing a variety of his Filtres Rapides; a name that is fast becoming a household word. Mr. Maignen has just opened a West End depot in Pall Mall, where the various kinds of this filter are to be seen and its simple construction explained.

Filters were also shown by Mr. W. L. Barstow, Pontefract, Yorkshire, the principal feature in which was that the water first passes through slabs of natural stone, and afterwards through a block of carbon.

Two meritorious inventions were shown by Mr. H. Jonas, Mortlake, Surrey, sole agent to Dr. Nicholls, the patentee. They consisted of a carbon closet and dust-bin. The first-named is a square galvanised iron closet having a wooden seat. The lid, which is hinged, is made in the form of a circular box containing soot, charcoal, or some other deodoriser. A perforated metal disc let into the bottom of this box causes a portion of the contents to fall on the excreta every time it is shut down. As a gas-tight joint is made when the lid meets the opening, the gases rising from the contents are absorbed or rendered innocuous by the antiseptic mixture in the box lid. The closet has two strong handles attached to it, enabling it to be removed for emptying, the contents forming a valuable manure. The dust-bin is secured against the escape of offensive smells in a similar manner to the closet. It is, like the closet, made of strong galvanised iron in different sizes. It is an admirable invention, and supplies a long felt sanitary want in the disposal of house refuse.

Mr. John Grundy, Duncan Terrace, City Road, exhibited

his warm air ventilating grate, the mode adopted being to utilise the chimney as a heating chamber, and carry the products from the fire up a flue-pipe in its centre to the roof. By this means a great amount of heat is accumulated, which is admitted by means of ventilators let into the chimney-breasts into the rooms on each floor immediately above. This plan has been adopted with success by other makers, and is worthy of more general adoption, both as a means of arresting the waste of heat, economising fuel, and reducing smoke in a corresponding ratio.

Messrs. Turner Brothers, St. Albans, Herts, exhibited with some commendable inventions. The 'Hercules' Gas Engine, patented by Mr. Turner, senior, is of the vertical type, the one exhibited being ostensibly of 1 horsepower, though really more, even in its nominal capacity. It is excellently made, simple in construction, compact, and economical, perfectly quiet in working, and there is no noise at the end of the exhaust-pipe. It is also notable for the absence of springs, levers, or small parts to get out of order. It is also stated to be one of the cheapest, if not the cheapest, in the market. A cheap, compact, and well made Saw-bench was also shown, and there were several specimens of iron lift and force pumps, an important speciality with the firm. Another invention of a sanitary character exhibited was a new water-waste preventer or flushing cistern, well named the 'Simplex,' on the syphon principle. Its advantages over many others appear to be in its simplicity. The syphon is formed in the shell of the cistern, pipes and bells being dispensed with, leaving the space clear and unimpeded for working, examination, and removal of any sediment that may collect. As the water is delivered from the bottom it is noiseless, and there are fewer working parts and less mechanism than in any with which the writer is acquainted. A single pull down of the chain, if only for an instant, secures the entire emptying of the cistern. The principle can be applied with equal facility to a urinal, and it has the practical advantage of being very low in price.

Mr. T. P. Cook, 34 Snow Hill, E.C., exhibited a variety of Interior Builders' Fittings, including sash-fasteners, cabinet brass-foundry, locks, and door furniture. Of the latter he had on show a very ingenious, though simple, arrangement for fixing the knob to the spindle, known as Dennis's Patent. It can be adjusted to the most minute degree, and is not liable to get out of order. Mr. Cook also exhibited his patent portable dustbin, described in the SANITARY RECORD of Oct. 15, 1884.

THE DUBLIN SANITARY ASSOCIATION.

At the annual meeting of this association, Sir George H. Porter, M.D., in the chair, Mr. LaTouche read the twelfth annual report, from which it appeared that the number of its members at present was 238; that the income for the past year was 261*l.* 15*s.* 11*d.*, as against an expenditure of 257*l.* 3*s.* 5*d.*, leaving a balance of 4*l.* 12*s.* 6*d.* The report described in detail the work done by the society during the past year. It then stated that the death-rate in Dublin for the year 1884 was 27.9 per 1,000, as compared with 29.1 for 1883, and 27.9 for 1882, and an average rate of 29.2 per 1,000 for the ten years preceding 1884. Although there had been a satisfactory decrease in the death-rate in Dublin for the past year as compared with 1883, and also with the ten years then ending, this city still retains its position as the most unhealthy of the great towns of the United Kingdom, and points to the necessity for increased vigour in dealing with the sanitary condition of Dublin.

The Chairman, in putting the resolution, regretted to have to say that Dublin yet afforded a large field for their exertions, having regard to the condition of many of their streets, the density of the population in some quarters, and the wretched habitations of the poorer classes. However, he was happy to say that they had done a great

deal of good work, and that they would be able to carry it out to the end. There was no doubt that that association had stimulated other bodies to look to the sanitary condition of Dublin. For instance, the Dublin Corporation had cleared about four acres, on which artisans' dwellings had been erected.

A NEW AMBULANCE LITTER.—Mr. Robert H. Nuthall, secretary to the Sunderland Provident Dispensary, and the inventor of an ambulance emergency case which has met with considerable acceptance in many parts of the country, has just completed an ambulance litter, which can either be used in conjunction with, or separately from, the ambulance case. It consists of two bronzed iron tubes, 8 feet in length, closed at the ends. These are kept in position by two cross-bars, with hooks at each end, and secured with set screws. A piece of tarpaulin, 6 feet in length, runs between the cross-bars, to one of which a pillow is attached, and two shoulder-straps or slings complete the arrangement.

YORKSHIRE SAUSAGES.—Fred Smith, general hawk, and Robert Wilby, pork butcher, were recently summoned at the Hull Police Court for selling or exposing for sale a large quantity of beef which was unfit for human food. It appeared that Smith had purchased the carcase of a diseased cow for 16*s.*, and disposed of a portion of it at a low price to Wilby, on whose premises it was found, along with some diseased horse-flesh, ready to be converted into sausages. A plausible defence was offered, but Mr. Twiss, the stipendiary magistrate, said that it was one of the worst cases brought before his notice. The public had a right to be protected from such infamous and disgraceful practices as the traffic in diseased meat. Both the defendants were committed to prison for two months each with hard labour.

ALDERMAN CAIL, of Newcastle, in consequence of constant complaints as to the limited and inferior water supply to the dense population of the various towns in Tyneside, has recently addressed a pamphlet to their authorities, showing how an abundant and satisfactory supply of water of excellent quality could be obtained for the above district from Ulleswater Lake in Cumberland and Westmoreland. No insurmountable or very expensive engineering difficulties present themselves, as the proposed source of this almost illimitable supply is situated at such an altitude as would enable the water to descend by its own gravity to all the villages and towns situate in the Tyne Valley as far as the east coast. The practicability of this scheme was amply demonstrated in the year 1874, when a careful survey of the district was made by a staff of experienced engineers and surveyors, at the instance and cost of Alderman Newall, of Gateshead. Unfortunately at that time the project did not receive the amount of support from the local authorities to which it was entitled; or they might now have been spared the unpleasant contemplation of a possible water-famine during the ensuing summer. Alderman Cail in his exhaustive pamphlet also urges that the Corporations of Newcastle and Gateshead should buy up the interests of the existing water company, whose resources are inadequate to meet public requirements in a satisfactory manner, so that their works might be made supplementary to the more comprehensive Ulleswater scheme. There are at present only about 900,000,000 gallons of water in store in the reservoirs of the Newcastle and Gateshead Water Company, whilst the daily consumption in those towns averages about 13 millions of gallons daily. It is stated that at least 550 millions of gallons of water flow out of the Ulleswater Lake into the River Eamont every twenty-four hours. It is to be hoped that the local authorities, in the face of an increasing population and necessarily increased consumption, will make some satisfactory effort to meet the growing wants of the community.

MUNICIPAL FINANCE.

THE growing importance of the financial administration of Corporations makes it very desirable that sustained attention should be devoted to municipal finance in the columns of a journal which chronicles the manifold ramifications and developments of public hygiene. With this view we purpose to give, from month to month, a table showing the market prices and other valuable particulars as to the consolidated stocks of corporations which are dealt in on the London and Provincial Stock Exchanges, together with a summary of the leading facts as to Municipal Finance which have transpired during the preceding month.

New Issues of the Month.

Since our last issue, two important corporations have come into the public market as borrowers of money. The Commissioners of Sewers of the City of London, who, though arrogating to themselves independent powers, are to all intents and purposes a Committee of the City Corporation, desire £1,000,000, which is to be expended in redeeming existing loans bearing a higher rate of interest, and in effecting improvements now in progress in the City of London. The City of Glasgow want £500,000 for much the same objects. But whilst Glasgow demands, and apparently obtains, at least £100 cash for every £100 of stock, the Commissioners of Sewers would have been content with 96 per cent. As a matter of fact, they got an average price of £96 10s. 11d., having offered the loan by the plan of public tender; but it is absurd to suppose that the credit of the City of London is 3½ per cent. worse than that of Glasgow. Probably the reason for the difference lies in the fact that the Commissioners' of Sewers Loan is in the form of debentures to bearer, subject to annual drawings, and repayable in twenty years; whilst the Glasgow Loan is a handier, safer, and more popular form of Stock, repayable in a lump at a fixed date (May 15, 1914).

The securities for the London Loan are the Sewers and Consolidated Rates, leviable by the Commissioners of Sewers in the City of London and the Liberties. The rateable value of the City has enormously increased during the last half century. In 1831, the rateable value was £797,904; by 1861 it had increased to £1,301,160; by 1871 to £2,476,616; by 1881 to £3,503,035; and it is now £3,623,133. The existing loans chargeable on the rates amount to £1,591,041, including £600,000 to be extinguished by the present loan.

The securities for the Glasgow stock, and for the other obligations of the Corporation, consist of—(1) Assessing powers over the city (a) for general police and statute labour purposes, which amount in all to 1s. 7d. per £, but are only exercised to the extent of 1s. 4½d. per £, which will yield at least £184,000; (b) for parks and galleries, which amount to 2d. per £, and yield, at least, £24,100; (c) for the Municipal Buildings Act, 1878 (1d. per £), which yields, at least, £12,200; (2) the rates leviable by the Corporation over the city and outlying districts for the supply of (a) water and (b) gas; (3) The properties belonging to the Corporation connected with the markets and slaughterhouses. In addition to these securities, the Corporation of Glasgow have power to levy a guarantee rate, unlimited in amount, over all lands and heritages within the city subject to assessment. The gross annual rental of the City of Glasgow for 1884-85 is £3,406,370. The borrowing powers vested in the Corporation under the provisions of their Loans Act amount, after deducting the sums set apart as sinking funds, to £4,246,334, and have only been exercised to the extent of £2,914,191.

Name of Stock.	Amount of Stock in Circulation.	Interest.	Dates of Interest Payments.	When Redeemable.	Highest and Lowest Prices				Closing Quotations April 10.
					During 1884.		Jan. 1 to April 10, 1885.		
					Highest.	Lowest.	Highest.	Lowest.	
Metropolitan 3½ p.c. Stock ..	£ 16,984,326	P.c. 3½	6th Jan., April, July, Oct.	6th Oct., 1920..	113	104½	108	101	101—103
" 3 p.c. " ..	7,250,000	3	1st Feb., May, Aug., Nov.	1st Feb., 1941..	103½	96½	100½	95	95—97
Birmingham Corporation Stock	3,445,693	3½	1st Jan., 1st July.....	On or after May 17, 1946..	104½	99½	100½	98½	98½—99½
Leekburn Corp. 4 p.c. Stock ..	330,290	4	1st Jan., 1st July.....	Irredeemable ..	—	—	—	—	110—111
Bedford Corp. 4 p.c. Stock ..	647,900	4	1st Jan., 1st July.....	Irredeemable ..	98	96	—	—	97½—98½
" 4½ p.c. " ..	1,568,437	4½	1st April, 1st Oct.	Various.....	—	—	—	—	103½—110½
" 3½ p.c. " ..	507,502	3½		Various.....	—	—	—	—	114—115
" 3½ p.c. " ..	272,745	3½		Various.....	—	—	—	—	—
Leicester Corp. Debenture Stock	1,209,380	3½	1st May, 1st Nov.	Perpetual.....	102	97½	99½	98½	99—99½
Leicester Corp. Stock ..	400,000	3½	5th Jan., 5th July	Within 40 years.	99½	97½	97½	96	96½—97½
Leicester Corp. Stocks ..	500,000	3½	15th May, 11th Nov.	Purchased	—	—	—	—	—
Leicester Corp. Red. Stock ..	500,000	3½	15th May, 11th Nov.	15th May, 1914.	102	99½	99½	98½	99—100
Leicesterfield Corp. Stock ..	250,000	3½	1st Jan., 1st July.....	1st July, 1934 ..	104½	96½	99½	99	99—99½
Leicester Corp. Stock ..	500,000	3½	1st Jan., 1st July.....	1943	103½	100	—	—	—
Leicester Conservancy Deb. Stock..	106,417	4	1st Jan., 1st July.....	Perpetual.....	103½	100	—	—	—
Leicester Cons. Deb. Stock ..	2,389,630	4	1st Jan., 1st July.....	1st July, 1927 ..	112½	108	110½	103½	110—110½
" 3½ p.c. " ..	558,720	3½	1st Jan., 1st July.....	1st July, 1927..	102½	98½	100½	99½	99—100
" 3½ p.c. " ..	628,153	4	1st Jan., 1st July.....	(Any time on 6 months' notice.	—	—	—	—	—
" 3½ p.c. " ..	280,553	3½	1st Jan., 1st July.....	31st Dec., 1934..	—	—	—	—	—
Leicester Redeemable Stock ..	6,070,000	3½	1st Jan., April, July, Oct.	Purchased	105½	98½	102	98½	98½—99½
Leicester Corp. Stock ..	100,000	3½	1st Jan., 1st July.....	1st July, 1932 ..	98½	98½	—	—	98—99
Leicester Corp. 4 p.c. Stock ..	3,775,735	4	24th June, 24th Dec.	Irredeemable ..	119½	111½	115	114	114—115
" 3½ p.c. " ..	91,935	3½	24th June, 24th Dec.	Irredeemable ..	—	—	—	—	100—102
Leicesterbrough Corp. Red. Stock	300,000	3½	1st Jan., 1st July.....	1st Jan., 1909 ..	—	—	104½	104½	99—101
Leicester Corp. Stock ..	450,000	3½	1st Jan., 1st July.....	1st July, 1936 ..	101	101	—	—	98½—99½
Leicester Corp. Stock ..	2,000,000	3	1st May, 1st Nov.	Irredeemable ..	86½	82½	84½	82½	80½—81½
Leicester Corp. Deb. Stock ..	423,040	4	1st Jan., 1st July.....	Irredeemable ..	—	—	—	—	110—111
Leicester Corp. Stock ..	400,000	3½	1st Jan., 1st July.....	1st Jan., 1924 ..	101	97½	99½	98½	99—100
Leicester Corp. Stock ..	500,000	3½	1st April, 1st Oct.	Irredeemable ..	101	95½	100½	98	98—99
Leicester Corp. Stock ..	253,188	4	25th March, 29th Sept.	1927	—	—	—	—	103—104
Leicester Corp. Stock ..	108,150	3½	1st March, 1st Sept.	1914-34.....	—	—	—	—	98—99
Leicester Corp. Stock ..	600,000	3½	1st Jan., 1st July.....	18th July, 1951.	99	94	97½	95½	96½—97½
Leicester Corp. Stocks ..	336,940	Var.	1st Jan., 1st July.....	60 years	—	—	—	—	—
Leicesterhampton Corp. Stock..	600,000	3½	1st March, 1st Sept.	1932 and 1942 ..	99	94½	98½	95½	95½—96

NOTE.—The Stocks marked with an asterisk (*) are transferable in books kept at the Bank of England; those marked with a dagger (†) at London Banks. The rest are transferable by deed in the usual way, and the Agents are officials of the several Corporations.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

'Something attempted, something done.'

ABERDEEN.—By no means an inconsiderable portion of this report, which is a careful and thoughtful production, is taken up with an account of the working of the system of compulsory notification of infectious disease, and a description of the homes of the poor. As regards the former, Dr. Simpson has much of interest to say. He observes that in Aberdeen the system has worked very satisfactorily, and without friction. This success has been mainly due to the cordial co-operation and aid of the medical profession. Individual members have several times at the sacrifice of their own interests, given valuable assistance for the public good. Apart from the question, not yet settled, whether one class of the community should be expected to be so self-denying, experience in the working of the Act has shown that the Act is incomplete, and that if the onus is to be laid on the medical men for the purpose of preventing disease, the same should be laid also on the citizens. For it is frequently in those cases where there is much danger to the public that a medical man is not called in at all, or, if so, at a late period of the disease when his services are useless, either to the patient or to the sanitary department. Thus, in two ways, the public health is apt to suffer; first, by the individual not obtaining the necessary medical attendance that might have prevented a fatal issue, secondly, by the spread of disease. Purveyors of milk and dairymen are especially liable to conceal infectious diseases that may have occurred on their farms, from the fear of personal loss they may sustain if it should become known, and from this cause great harm frequently accrues. It is from these unknown (unknown until the mischief is done) sources that people frequently owe their typhoid fever and diphtheria. Speaking of the homes of the poor, Dr. Simpson has a painful and, unfortunately, a common experience to relate. Many of the houses inspected during the year (and they numbered over 10,000) were damp, dark, ill-ventilated, and dirty, requiring light, ventilation, repair, and cleaning; some uninhabitable, and others overcrowded. The prevalence of these conditions has not been overlooked by the authority, for by continuous inspection and energetic action, many of the dreary and unhealthy homes of the poor have been quite transformed, and by securing dryness, light, and ventilation, have been made more healthy and comfortable. As a rule, however, neither the occupier nor proprietor appreciated the boon conferred by these alterations. Pending the decision of the Royal Commission, Dr. Simpson advises his authority to proceed slowly in the matter of improvement schemes, and urges, in the meantime, a vigorous and stringent enforcement of the regulations relating to houses let in lodgings. The health of the town was very satisfactory in 1883, the general death-rate (19·05 per 1,000) being lower than any previously recorded. From the principal zymotic diseases also, the death-rate was below the average, representing 1·0 per 1,000. Whooping-cough was the most fatal of this group, destroying 63 lives; diphtheria accounting for 17 deaths, typhoid fever for 16, and typhus for 8. The circumstances attending the prevalence of these diseases, as well as the measures adopted for their repression, are carefully recorded by Dr. Simpson. The infectious hospital proved of signal service during the year, although the means for securing the removal of patients were quite inadequate.

DUNDEE.—The fact that no fewer than 248 deaths (of which 231 occurred in children under five years), out of a total of 550 referred to zymotic causes, were recorded from whooping-cough, is a subject to which Dr. Anderson devotes much attention. The number of children living in the burgh under the age of five is estimated at 19,735, and the mortality from this disease alone reached the

terribly high rate of 14 per 1,000. In asking for the causes of this excessive fatality, Dr. Anderson is of opinion that the two factors mainly responsible for this widespread and long-continued epidemic were the ignorance of many parents as to the serious and fatal character of the disease, and the attendance at school of children from infected households. There is a general opinion amongst the public that whooping-cough is a mild disease of children, that each child must take it, and the earlier the better, and that no precautions are necessary to protect their own or their neighbours' children. It is indeed singular and curious, as Dr. Anderson observes, to note how this fatal and pestilential belief survives in the public mind, notwithstanding the most overwhelming evidence to the contrary annually afforded by vital statistics. With regard to the influence of school attendance, it is estimated that there occurred 2,822 cases of infectious disease during the year, and yet there were but 40 applications for certificates of freedom from infection. The only inference to be drawn from these figures is that many parents and teachers evaded the law, and Dr. Anderson advocates, as the only remedy, the rigorous punishment of every offender. Typhoid and diphtheria (which together caused 81 deaths) were prevalent throughout the year, and were found largely in association with sanitary defects. There were repeated outbreaks of typhus fever in various portions of the district, which, thanks to the sanitary organisation of the burgh, were easily and speedily suppressed. Dr. Anderson speaks in high terms of the utility of the compulsory notification of infectious disease, which from the first has been an unqualified success. The death-rate from all causes is estimated at 23·91 per 1,000 of population.

IPSWICH.—The sanitary condition of this borough continues to improve under Mr. Elliston's able supervision. During 1883 the arterial system of sewerage was actively pushed forward in all parts of the town, new sewers having been constructed in upwards of 124 streets and roads, thus relieving many extensive and populous localities. In dealing with this subject, Mr. Elliston properly reminds his authority of the importance of seeing that all houses are connected with the main sewers under skilled supervision, and to this end he advises a house-to-house inspection. The deaths from zymotic causes numbered 97, being equivalent to 1·85 per 1,000, which is below the average of the previous ten years. There was a sharp epidemic of whooping-cough in the spring, and measles became prevalent towards the end of the year. Scarletina continued to crop up month after month in various parts of the districts, but only 10 deaths were registered from the disease. The Infectious Hospital played an important part in preventing this outbreak from assuming epidemic proportions, and, by isolating some of the worst cases, it gave a continuous check to the natural rate with which the disease would otherwise have increased. As many as 58 cases of scarlet fever were removed to the hospital. A large number of these were adults, who passed through a severe attack, but in no case did the disease terminate fatally, all the patients being discharged cured. There was a marked decline in the mortality from typhoid fever, and the fatality from diarrhoea was below the average. The death-rate properly due to the town is estimated at 19·2 per 1,000, the lowest, with one exception, on record; and Mr. Elliston takes advantage of the completion of the tenth year of the operation of the Public Health Act to emphasise the results which have followed from its energetic administration in Ipswich. At a low estimate 600 lives have been saved, and some 3,000 cases of sickness prevented. Having regard to these figures, and to the low death-rate recorded in 1883, Mr. Elliston has much reason to be gratified with the results attending his administration of the sanitary laws.

THE USE OF OPIUM.—Dr. O'Hanlon, medical officer of the Spennymoor Local Board District, reports that the use of opium is spreading amongst the female population of that district.

DIETETIC NOVELTIES.

LONDON MANUFACTURING COMPANY'S MEAT PREPARATIONS.

IES of most beautiful, delicate, and first-rate preparation of Meat have been submitted to us by the London Manufacturing Company. Essence of meat, transparent in colour, concentrated beef tea of a delicate yet full meat flavour and odour, and turtle soup of excellence, are the company's specialities. Their purity and nuineness make them specially adapted for invalids, and they will no doubt meet with the appreciation and reserve.

The company's factory is most elaborately fitted up with digesters, enamelled pans and baths, and is kept in admirable condition of cleanliness and sweetness. This is a necessity both for the manufacturer and the consumer; a factory that has once been infected with germs of disease can never turn out preparations free from and possessed of unlimited keeping qualities. The London Manufacturing Company's preparations are, as a matter of fact, entitled to the highest commendation.

NEW INVENTIONS.

SANITARY STOVE-SCREENS.

The spread of sanitary, that is to say cleanly, notions is spread in small things as well as great; from sewerage to ornaments. Formerly people used in the summer months, when fires were given up, to cover their stoves with dust-collecting paper curtains of a more or less decent character, which also impeded ventilation by chimney. The willow-shavings, which were also used for bright stoves, were likewise liable to the objection of being dusty and black. These expedients for hiding ugly iron stoves are now superseded by small folding wire screens placed in front of the stove, concealing it without impeding ventilation. These screens are generally of stout millboard, painted or printed in various designs suited to all kinds of furnishing, and, if carefully used, add to the adornment of a room. They are, of course, removed whenever a room is cleaned, and the action of a duster removes any loose dust which may have adhered to their surface during the week. Another advantage appertaining to this form of screen is that they are made of coal and wood, which Sydney Smith declared to be the best stove ornaments, can be kept in the stove all year round, so that paterfamilias can have the luxury of a fire on a chilly evening, even in the summer, without the trouble of removing the little screen in the fire-

place. Messrs. Charles Lee & Co., of 78 Milton Street, E.C., held an exhibition of these sanitary stove-screens at the Manchester Hotel, Aldersgate Street, which gave those who attended it an opportunity of noting the variety and moderate price of these pretty appendages to the fire-stove.

Much ingenuity has also been expended in making screens applicable for other purposes than merely shielding the fire-stove.

REVIEWS.

Years' Experience (now Fourteen Years) in Works Intermittent Downward Filtration. By J. BAILEY-DENTON. E. & F. N. Spon.

THIS is the second edition of Mr. Bailey-Denton's well-known work. The history of intermittent sewage filtration is of great interest from the time when Dr. Frankland's experiments were published by the Rivers' Pollution Commissioners, on the Mersey and Kibble basins (1870) to the present time. From one cause or another, the system of sewage treatment appears to have met with

constant misrepresentation and abuse ever since it was first essayed in practice at Merthyr Tydfil in 1871. It should be generally known by this time that Mr. Bailey-Denton recommends the use of intermittent filtration beds in connection with land treated with surface irrigation, reserving a small portion for osier beds for the reception of overflow waters. Where a large extent of suitable land is difficult to acquire, the proper defecation of the sewage to be dealt with, can be accomplished by intermittent filtration alone, at a moderate original outlay and without the slightest nuisance. With a suitable soil and proper preparation of it, the sewage of nearly 3,000 persons may be treated successfully upon one acre of land, and in unfavourable soils the sewage of as many as 1,000 persons can be perfectly defecated upon the same extent of land.

A complaint that is constantly made by holders of surface irrigated sewage farms, is that they are obliged to dispose of the liquid sent to them whether they want it or no. If they could have just the amount of sewage that they require, and at the periods when they require it, they would be glad enough to pay a moderate price for it. For instance, during a continued drought the tenant of a sewage farm would be very glad of a large supply of screened sewage. But at other times it must often be the case that he would much prefer, not to take any for a week or so at a time, rather than flood continuously his already supersaturated land. By combining intermittent filtration with surface irrigation, the possibility of satisfying the farmer in this direction is arrived at. When the sewage is not required upon the farm it is turned upon the filtration beds, so that the farmer can satisfy himself completely in this matter, taking much or little as he sees fit. It must not be forgotten either that if the filtration areas are properly cultivated in ridge and furrow, vegetables can be grown upon the ridges (out of reach of the liquid sewage) with great success. The use of osier beds springs from the fact that it is practically impossible to treat the overflow waters in time of storm. This water, therefore, is turned upon the osier beds for clarification before finding its way to the natural stream of the watershed.

The author determined that as intermittent filtration had been somewhat prominently referred to in terms of approval by the Royal Commission on Metropolitan Sewage Discharge, and as the first edition of the work in question was out of print, to issue a second edition through the same publishers. In the preface to this edition, Mr. Bailey-Denton quotes *in extenso*, from the report of the Commissioners, a favourable description of many of the works designed by him. The Commissioners, in conclusion, compare this process with surface irrigation in regard to the three questions—Will it produce effectual purification? Will the process be in any way objectionable? What will be its cost? These three questions the Commissioners answer practically in favour of intermittent filtration. The author then explains the present satisfactory condition of the several farms which formed the subject of the first edition. He subsequently considers the following selected cases that have been dealt with since the date of the first edition (1880)—*i.e.* Dewsbury, Yorkshire; Withington, Lancashire; and Watford, Hertfordshire. In each of these cases, even when the proper conditions have not been fully attended to, a real practical success has been obtained. It is suggestive of the state of the brooks in some parts of Yorkshire that the author says, concerning the Dewsbury works, 'The sewage consists chiefly of dye wash; nevertheless the effluent is very good, and everyone that sees it is surprised to see how clear it is. There are a good many mill hands come to have a bathe at the outlet, it being the only clear water for miles that they can bathe in.'

These additions to the second edition add considerably to the value of a very useful work, which ought to be in the hands of everyone interested in the subject—and who nowadays is not? Mr. Bailey-Denton has published many useful works, but probably none of them are of more general value than the work before us.

Foundations and Materials used in Buildings. By JOHN HOLDEN, F.R.I.B.A., F.S.I., President of the Manchester Society of Architects. John Heywood, Manchester, and 11 Paternoster Buildings, London.

MR. HOLDEN deals practically with the ordinary problems in building, commencing with foundations, the circumstances under which concrete becomes necessary for purposes of stability, the proper method of laying footings, and other matters. His remarks on the sanitary importance of a good foundation are well worthy of attention.

'You all know,' says the author, at p. 60, 'that in large cities like London, Manchester, Liverpool, and others, there must of necessity be a very large amount of refuse always to be got rid of, and low lands are eagerly sought after to be used as tips. This is all very well so long as the land is in the country and lying idle, but as these tips are generally close to the towns (the closer the better, cartage being a consideration), as soon as the depression is filled up with this rubbish—very often partly nightsoil—the owner finds that his land has been converted into building land and is marketable, and, quite irrespective of the consequences, it is disposed of and built upon. In Manchester the nightsoil is at present dealt with by the Corporation in another manner, so that we must not credit them now with tipping that material; but Harpurhey and Collyhurst are instances of this mode of treatment in former years, and I well remember in 1865 surveying some land in Harpurhey, close to the continuation of Queen's Road. I had several days' work there in settling some boundaries, and the low land at the side of the road was in process of being filled up with nightsoil, road scrapings, and rubbish. The stench was something horrible, and effectually spoiled my appetite for the time. But the opportunity was too good to be lost by the owner of the land, and cottages were built as close to the edge of the tip as was practicable. This part, of course, is now all thickly populated, and we may imagine the state of these houses, built of the lightest materials, with little regard for sanitary arrangements (which in those days were very much worse than they are now), and with not the slightest attempt made to counteract the evils existing below. But tenants were plentiful, for poor people are obliged to live close to their work, and must put up with anything in the way of shelter.'

He suggests that where land has been filled up in the manner described, the authorities should not allow any buildings to be placed upon it until the plot has been levelled, and a layer of good concrete, twelve to eighteen inches thick, formed over the entire surface intended to be covered by buildings.

'No doubt,' says he, at p. 61, 'the landowners would fiercely oppose this expense, but when by such means as these tips, land, *practically valueless*, is made worth 5*d.* to 7½*d.* per yard, or a rental of from 100*l.* to 150*l.* per acre, I contend that the owner should be *forced* to spend some of this gain (towards which he had done absolutely nothing) on the land itself for the protection of the public.'

Referring to the importance of damp-proof courses, the author recommends the use of asphalt, strong cloth pitched both sides, felt, or lead, discarding slate for this purpose, from its liability to crack under pressure. He also advises coating the outside of a wall with pitch, or a mixture consisting of 3 lbs. of pitch to a gallon of tar, with a little naphtha. This, he says, will decay and come off, but in the meantime the mortar will have become hard, and the wall will be kept dry. One expedient for curing damp walls, which he says he has tried with success, consists in filling in the space next to the outside of the wall for about eighteen inches to two feet wide with brick rubbish, through which the moisture getting at this part will percolate into a drain provided for the purpose. The top in such a case is covered with cement, to prevent water from running off the walls into the trench, a gutter being formed to convey it away. Mr. Holden very properly recommends the use of non-absorbent bricks for building purposes, so far as they are obtainable, laying it down as

a rule that they should not take up more than 20 per cent. of water. It may be doubted whether he will meet with unqualified support in his objections against the grouting of walls and pargetting of flues. That both practices are often made a means of partly remedying or concealing defective work, we do not deny; but we cannot always be certain of securing the desired standard of non-porosity in every brick used, and when so much water is liable to be absorbed by the bricks as to prevent the mortar from setting thoroughly, grouting is advisable. As regards the pargetting of flues, it is practically impossible to guard against open joints in internal work, and the pargetting forms a safeguard, although too frequently an imperfect one.

We are glad to note that Mr. Holden advocates keeping basement windows as much as possible out of the ground, thereby dispensing with cellar areas, which he rightly designates 'filthy nuisances.' In his remarks upon timber, he records some curious experiences in connection with dry rot. In one case the fungus attacked the timbers of a ventilated floor to an alarming extent, while the floor of the adjoining premises, which was unventilated, remained unaffected. We agree with his recommendation that every part of a building should be easy of access for cleaning purposes—a desideratum too often overlooked, and also with his remarks upon the advisability of avoiding hollow spaces under floors. A warning that occurs more than once in the pages of this little pamphlet, should be laid to heart by building owners and architects—to give personal attention to the qualities of work and materials.

Principes Techniques d'Assainissement des Villes et Habitations. Par A. WAZON. Paris: Baudry et Cie.

THIS is a remarkable book. Remarkable in two ways:—firstly, because of the high uniform merit of the work itself; secondly, because it marks in so powerful a manner the fact that France is awakening to the claims of sanitary science.

This work is the production of an experienced engineer, who has evidently devoted considerable time to the exhaustive study of all writings bearing directly or indirectly upon the subject before us—not only French or German writings, but English and American also, and including the leading technical journals in both countries. His constant acknowledgments in foot-notes and in the text testify to this fact in the most liberal manner, and appear to us to prove that he has passed over no known authority upon the subject.

M. Wazon approaches his task with all the deliberation of a practised writer. His preliminary division of the work is as follows:—

1. The supply of pure water to towns.
2. The distribution of the water to houses.
3. Drainage of houses.
4. Drainage, &c., of public ways.
5. Public sewers.
6. Utilisation of sewage waters in agriculture.

Thus he starts with pure water; and after it has been supplied to the house, and has passed away with the soil, he follows it along the sewers till it is used to fertilise the land, and eventually reappears to join the river, approximately as pure as when originally taken from the same stream.

This work is, in fact, a study of the problem of sanitation in connection with Paris, although a greater portion of it is of course applicable to other towns.

The six divisions of the work are again subdivided elaborately, and each subdivision is exhausted with the deliberation of a professor; in fact, we shall see that if the author errs slightly at times, it is in attaching undue importance to arguments which might well convince a student, but would have met with less success from one who relied more upon extended personal experience and less upon books. For M. Wazon will, we are sure,

pardon us if we assume that a French engineer cannot unfortunately have had much professional experience in many of the subjects treated upon in his masterly work.

M. Wazon commences by considering how much water is necessary for an effective supply for all purposes to a town like Paris. It appears that Paris nominally receives a supply equivalent to 168 litres per head per day; but that in 1881, and again in 1882, a water famine was experienced of such severity that placards in the public streets warned everyone to economise the precious fluid in every possible way. The only town in France which is satisfactorily supplied is Marseilles, in which every inhabitant receives a cubic metre per diem. The experience of New York curiously enough confirms that of Marseilles. When the new supply from Lake Croton is completed, New York will have a total of 350,000,000 gallons per diem; and as the population in a year or two may be taken at 1,500,000, it will be found that each inhabitant will have a provision of a cubic metre of pure water every day. Assuming that the population of Paris will reach two and a half millions in 1886, our author concludes that the same number of cubic metres of pure water should be provided daily for that town. The existing means of water supply to Paris are then carefully considered, and minutely estimated one by one.

Rain-water cisterns are never of much practical use in large towns; and, in Paris, we can well believe M. Wazon that the 'locataires' of the Mansards often empty into the gutters liquid refuse, which, descending into a rain-water cistern, would of course prevent the possibility of its being used for domestic purposes.

Wells.—Of these Paris possesses about 30,000, but they are unfit for domestic purposes, being contaminated by drainage from cemeteries and from the numberless cess-pools still in use.

The main resource of Paris is shown to consist of the following sources:—The aqueduct of Arcueil, which supplies a pure water; the aqueducts of Près St. Gervais and Belleville, which supply a selenitic water hardly suitable for drinking; the Canal de l'Ourcq, whose waters are only fit for flushing the sewers and channels, and fire extinction, &c.; artesian wells at Grenelle, Passy, and Butte aux Cailles; the aqueduct of Dhuis, which delivers a pure drinking water; the excellent water of the Aqueduct de la Vanne; various deliveries of the relatively pure water of the Marne, and of the tainted water of the Seine.

These sources yield about 459,000 cubic metres daily. Our author, after considering various minor projects for increasing the water supply, enters into a most interesting description of a project for bringing 1,800,000 cubic metres daily from the Loire. If this project were carried out, he calculates that the total supply would stand as follows:—Present actual supply, 459,000 cubic metres; various minor projects, 261,000 cubic metres; from the Loire, 1,800,000 cubic metres; total daily supply, 2,520,000 cubic metres. This total is, of course, the amount which the author starts by requiring.

It is laid down by M. Wazon that as the water once taken from a pure source is kept sealed from all defilement in a proper subterranean aqueduct, so it ought in like manner to be kept sealed and free from all possibility of pollution, until it is delivered at each household fitting. The regulations for water supply in force in Paris are commented upon and objected to, and the author is then led to examine in detail the ordinary method of installation. The first objection is taken to the use of lead pipes; various substitutes are examined—as plain iron pipes, lead lined with tin, galvanised iron, tinned iron, enamelled iron, iron pipes prepared with Angus Smith's solution, and lastly, iron pipes protected by the Bower-Barff process; which latter arrangement seems to be preferred by M. Wazon, though the practical difficulties which impede its general adoption are apparently overlooked. Storage cisterns are condemned, in accordance with the principle laid down; for, says M. Wazon, the water in a storage cistern is never

closed to dangerous germs, besides that they are subject to visits from insects, birds, rats, and the cats that follow them. Such cisterns must always be liable to contain much organic matter, and are almost necessarily placed in the worst position to maintain their contents at an equable temperature—cool in summer and mild in winter. M. Wazon would substitute for the cistern an ingenious apparatus (of Carré's) in the basement, which would retain a supply of water, and maintain the pressure through the pipes even when the public mains were empty. He claims that the water would easily be kept at the proper temperature, would be absolutely safe from contamination, and, in case of an accident, instead of a dangerous overflow, you would have only a pool in a basement cellar. He does not meet the fact that this would be a far more complicated and costly affair than the ordinary cistern arrangement, and more costly and troublesome to keep in order. To take one small point, it would involve the use of nine valves instead of four, a fact of importance surely to all who have extended experience in arranging such matters for the use of the ordinary householder.

The water-main, after leaving this really ingenious contrivance, ascends and branches to each flat, and delivers into sealed filter-cisterns for potable water and into waste-not flushing cisterns for water-closets, &c.; in this way it is designed that from the moment the water is taken from its source to the time that it is actually drawn off for use it is preserved fresh, aerated, but absolutely free from contamination of all kinds.

The next subject treated of is domestic filters. A lucid and careful description of all the leading filters is given, and spongy iron is selected as the best material. Most of the ordinary cistern-filters are objected to as not providing for the constant aeration of the filtering material. This objection cannot be applied to the simple cistern-filter designed by Mr. Bailey-Denton; but, while according it all praise upon this particular, M. Wazon points out that it is necessary to take the filter to pieces to clean the filtering material. This would militate against the constant cleansings, which he considers of so much importance. Our author, therefore, awards the palm to a clever self-acting closed cistern-filter, made by Carré of Paris, which he describes and illustrates.

The domestic hot water service is next treated of. Various systems are illustrated. The special conditions of Paris life, the living in self-contained flats on one floor, render the supply by means of a hot-water cistern undesirable, as so little pressure can be obtained upon the fittings, and consequently large pipes and fittings have to be used. Besides that, the warm water that is constantly drawn for domestic purposes is, we are told, left open to contamination, though this is, as we know, not necessarily true. M. Wazon recommends the adoption of the American cylinder system, with some thoughtful amendments of his own. He then treats of the supply of water to water-closets, urinals, sinks, and hydrants, and reviews the arrangements made for house supply in Paris, adding a series of well-considered suggestions as to official inspections into the waste of domestic water, and with twelve clearly defined conclusions sums up this second part of the volume.

The third part, like all the others, starts with general principles and ends with conclusions. This part treats of the removal of Domestic Residua (drainage, dust, vegetable and other refuse). Before the siege of 1870 all dry domestic refuse had to be placed in the streets between 7 P.M. and 7 A.M. But since that time it may only be placed in the street at the time that the carts are passing—that is, from 5 A.M. to 7 A.M. To obviate the inconveniences attending such an arrangement, many concierges have provided receptacles in which all the residents of the house can deposit their refuse at all hours. The author suggests the addition of a pipe with doors upon each floor as a shoot for such refuse, although he does not seem to be fully aware of the objections that have in practice been made to the use of such shoots. The connection of rain-

water pipes with drains are, it seems, officially ordered to be made direct, with the protection only of a small iron syphon at the foot of each pipe. This is rejected for a proper disconnecting trap, for it will be remembered that in Paris a large number of Mansard windows usually dominate the heads of the rain-water pipes.

Internal domestic drainage is the subject of the next chapter. M. Wazon condemns the direct connection of soil-pipes with drains, and, rejecting all valves as a means of disconnection, considers in an elaborate chapter the value of a water trap for this purpose, and, in conclusion, advocates its use. The valuable labours of Dr. Carmichael, Professor Tyndall, Wernich, and Raphaël Pumpey are passed in review. And Dr. Miquel is shown to have arrived at the same conclusion as Dr. Carmichael upon the vexed question whether germs can pass through a water trap or escape with the evaporation of the water, for he says, 'The vapours rising from the most impure waters are always exempt from germs.' Various forms of traps are considered and described, their ventilation is very fully discussed, and the author proceeds to examine one by one the various domestic fittings and their installation, the most important being the water-closets. It appears that no *ordonnance* interferes with the installation of a water-closet. It may be with means of ventilation or without it, against an external wall or in the darkest corner of the staircase. It may be connected with a drain or with a fixed cesspit, or even a *movable* one. When rules are made they are more often very misleading. Soil-pipes of cast iron must have an internal diameter of 20 centimetres ($7\frac{1}{2}$ inches), and if of glazed ware a diameter of 25 centimetres ($9\frac{1}{2}$ inches). This latter diameter is obligatory also for the ventilation-pipe, which has to be taken up from the cesspit.

The dangers arising from the use of large soil-pipes of glazed ware in rapidly built houses must indeed be appalling. M. Wazon divides the multitude of closets into three classes—pan closets, wash-out closets, and hopper closets. The first class of course he dismisses very summarily, and the second class he considers imperfect, and ultimately prefers the last class. Amongst the latter class he commends Hellyer's Artisan and Vortex closets and Buchan's ingenious Carmichael closet. Advising the abandonment of the usual wood enclosures, he describes them as 'enclosures which soon become the receptacle for dust and putrefying leakages, and thus constitute a veritable chamber of horrors full of effluvia and of dangerous germs in the event of a contagious illness in the *'appartement.'*'

As cesspools are still largely used in Paris, and are costly to empty, it will be readily understood that the proprietors are opposed to the proper installation of a pure water supply on every floor, and still more energetically to the use of water-closets. The various kinds of cesspools are described, and amongst them we find the movable cesspit, *i.e.* a watertight cask of the maximum capacity of 250 litres, which is placed in a cellar under the foot of the soil-pipe. It is needless to say that these casks often overflow the cellar to a great extent through not being emptied often enough, and are quite incompatible with the use of water-closets. The various systems of main drainage are described and illustrated by four pneumatic systems, and four systems actuated by gravitation. The English system by gravitation is finally recommended for adoption.

The French, German, American, and English methods of house drainage are forcibly reviewed, and here we think that our author's rather 'doctrinaire' view of the subject leads him astray. One of the immovable axioms with which he starts is that all traps should be ventilated against syphonage. Looking, therefore, at the drawings and writings of the principal English authorities upon the subject, he finds little or no mention of this important point, and at once condemns them. Our readers will be sorry (if amused) to find on this black list Capt. Douglas Galton, Professors Corfield, de Chaumont, and Henry Robinson, and Messrs. Rogers Field, O. Tarbotton, &c.

The indictment against Mr. Rogers Field seems especially weak, for in the illustrations to the Annotated Model By-Laws (which are the occasion of Mr. Field's condemnation) he only illustrated the meaning of a certain text placed before him, and did not attempt to show what he considered a perfect arrangement of plumbers' work.

Fortunately there exists one man who has saved the reputation of this country. Mr. Hellyer, in 'The Plumber and Sanitary Houses' has shown every trap in the house ventilated, so England is safe once more. M. Wazon does not appear to admit that, under some circumstances, traps do not require to be ventilated, and certainly does not appreciate the special dangers which follow in the train of their indiscriminate ventilation.

The English system of house drainage with, of course, the ventilated trap, is the one which M. Wazon recommends for use in Paris.

The fourth part, on the sanitation of public ways, leads our author to the conclusions that impermeable pavements should generally be adopted, that the planting of trees should be increased, that subsoil drainage should be undertaken in low-lying quarters, that special precautions should be taken to prevent the impregnation of the soil with gas, that it is desirable to increase the number and efficiency of public urinals and water-closets, that the cleansing of the streets of Paris may be considered as a model of what it should be, and that frequent watering of public ways in dry weather is absolutely indispensable.

The fifth part supplies an interesting history and description of the Parisian system of main drainage, and discusses the details of the sewers (manholes, &c.) in comparison with those of England and America.

In the sixth and last part, the various methods of utilising sewage in connection with agricultural land are judiciously considered, but though intermittent filtration is fairly treated of, Mr. Bailey-Denton's happy combination of the latter with surface irrigation is not mentioned.

The arrangement of the work throughout is exceptionally methodical, and it is expressed in a simple terse text that is lucid to the last degree. For these reasons the book may well serve as a model to many practical writers in England. We know of no English work that treats this subject in so thorough and exhaustive a manner, and we hope that M. Wazon will receive the appreciative thanks of his countrymen for his very useful work.

Robert Boyle, Inventor and Philanthropist. A Biographical Sketch.

THIS little book contains a biography of the late Robert Boyle, the original inventor of the well-known air-pump ventilator, which, however, has been improved on by his son, the present head of the firm of Robert Boyle & Co.

Robert Boyle, sen., was evidently a most energetic and persevering man, who, early in life, showed remarkable aptitude in mastering scientific knowledge of all kinds.

One of his first public acts seems to have been the establishment of depôts in Glasgow for the supply of pure bread for the poor, an article not to be obtained at that time. He appears also to have passed a great deal of his time in delivering lectures in connection with missionary and other philanthropic work. These were, as usual, illustrated with dissolving views, and we are told that 'the whole of the apparatus, even to the grinding and polishing of the lenses, was the work of his own hands.'

We are told that Mr. Boyle had the idea of diminishing the number of wars by making war more terrible. With this end in view, he invented a detonating powder of great explosive force, and submitted it to the Government, by whom it was not (in the inventor's opinion) properly treated. A sincere desire to improve the ventilation of poor dwelling-houses apparently led to the gradual development of the air-pump ventilator, which passed through many stages before it reached its present form.

The remainder of the book before us is filled with testimonials from capable witnesses as to the value of the

—the best fixed extraction ventilator before the day, and to the intelligence with which Messrs. Boyle and I have carried it out in various important works.

Practical Plumbing. By P. J. DAVIES. Vol. i. N. Spon.

It forms the first volume of what may be regarded as a cyclopædia of plumbing and kindred subjects. It is an experienced plumber, whose writings on the subject in the *Building News* and other papers must have been noticed by most of our readers.

It is, no doubt, primarily intended for the instruction of the young apprentice to the craft, but it contains a large amount of information that will be well received by many others.

Subjects treated upon in this volume include among many others:—The production of lead from the subsequent manipulation, lead casting, lead-soldering, lead milling, solder, soil-pipe making, lead-joint making, elbows, bends, and joints, traps, cisterns, filters, sanitary plumbing, ventilators, hot-water supply, testing drains, tanks and water pipes, soil-pipes and traps, waste-pipes, ventilation, closets, urinals, lead light and glass glazing. Mr. Davies, in his laudable efforts to give a work inclusive of all that shall be of value to the plumber, gives extracts from Acts of Parliament having to do with the supply of water and formation of drains, in the metropolis, a list of the turncocks of the various water companies, a series of examination questions for students of the craft, and a specification of work which he has kindly added for the use of the plumber, and the descriptions in which are ingeniously illustrated by references to the book itself.

Small things indicate the care with which the work has been compiled, such as a list of books useful for reference, and a directory of the leading tradesmen. A portion of the work is pretty well known from having already appeared in print, though we may remind the reader that it contains an immense amount of really technical information, replete as it is with tables and receipts of considerable value.

It is very good to see that Mr. Davies is a safer instructor in plumbing than in questions of sanitary engineering, as is called. On the subject of the size of soil-pipes, for instance, he says that his practice is, for any building not more than from fifteen to thirty feet high, to put a 6-inch drain if laid with a good fall, otherwise a 4-inch. For houses with from thirty to eighty rooms, he says to put a 6-inch with a good fall, or 12-inch otherwise! Has he considered what size sewer would be required for a small town, for instance, if the drains were laid at this ratio.

There are very few works that are free from blemishes, but this work is no exception to the rule; though the one that we refer to is one that can be easily remedied in a new edition, if the energetic author has only courage to do so.

It is due to the fact of the personal ubiquity of the author, as Mr. Davies does, on almost every page of his work, from the title-page to the examination questions.

We are not allowed even to peruse the extracts from the book in peace, for after many of the sections the author seems to comment upon them. All this arises from a genuine desire to make all the world acquainted with the subject as Mr. Davies is himself. We think it will probably be found to weary the reader, but it is the author's object.

The work is profusely illustrated with 2,000 blocks, which might very well be improved upon, is supplied with a good index, and will, we doubt not, prove a technical standard work.

CORRESPONDENCE.

Audi alteram partem.

[All communications must bear the signature of the writer, not necessarily for publication.]

VENTILATION.

I trust that you will be able to grant me space for the following remarks in your valuable columns, the purpose of which is to ventilate ventilation.

I am writing specially in reference to the system of ventilation lately introduced and patented by Mr. F. H. Smith, 52 Queen Victoria Street, E.C.

My attention had been called to this system by a friend of mine, who knew that I took great interest in this subject, and am struggling to discover which out of all the various methods is the more perfect.

In the year 1734 Desaguliers invented a plan for ventilating which was by propulsion, it being a fan enclosed in a box; and since that period we have had all manner and shapes brought before us in fans, but so far as perfection or satisfaction is concerned the results have not been satisfactory, all systems of fan ventilation being, so far as I know, simply efficacious in creating draught.

Mr. Smith's system of ventilation is not in the strict sense of the term propulsion, and yet by the admission of the cold air close to the floor it is almost turned into one.

By referring to the drawings in your last number illustrating this system it will be seen that the air introduced by the 'fresh air inlet' strikes against a plate and is supposed to separate, part ascending to the outlet, the remainder taking, for some unknown reason, the contrary direction. The part which is supposed to go downward strikes against a flange plate, and is thus supposed to be guided into the outlet. Now, it appears to me that the air in the exhaust will simply be describing circles, the top of the exhaust being perfectly open, and little or none will ever find its way out, and certainly, from my own observations, not sufficient to be of any advantage to the room on which the exhaust is placed.

Mr. Smith and Mr. Barnes Austin were both exceedingly kind in trying to prove to me the marvellous efficacy of the system by means of the anemometer, which I told them conveyed no idea as to the actual working of the system to my mind. But if the anemometer be a fair test, it certainly proved their system, which has been so highly eulogised in the columns of the *Times* and your own journal, to be a complete failure.

In the first place, I would ask why does the anemometer remain motionless when on a line with the ceiling in the exhaust? Surely if any air were being extracted from the room the anemometer would revolve. Secondly, why does the anemometer remain motionless until above what in the section is termed the 'fresh air channel'? Thirdly, what is the reason of the anemometer revolving at such an increased rate when near the sides of the exhaust? I, in my ignorance, always believed that the air close to the sides, on account of the friction, had a less velocity than in the centre.

In Mr. Smith's system I can quite understand the reason of the increased rate at the sides on account of its being immediately above the 'fresh air channel'; proving thereby that the current which drives the wheel is caused solely by the air which is passing up the 'fresh air channel.'

There are yet other points which I should like explained. Referring to your article of March 16, I should like to know the 'natural laws' upon which this system is based? and how is the hot air, which is the weaker, supposed to be able to battle its way through the cold? What is the meaning of 'all being performed automatically by natural law'? What is the meaning of the following passage? 'Syphonic action is at work constantly, regu-

isted by the requirements of the room. Thus, if one person only is in the apartment, sufficient fresh air is provided for him; if the number of occupants be multiplied, so the action increases; each person gets a proper supply, while the extractor is multiplied in its work in a similar ratio.'

The construction I place on this is that if one person enters a room he brings in by some miraculous means sufficient air for his requirements, and that each successive person brings in the air he requires according to the time he is to remain in the room. Were this possible, it would be a most convenient arrangement, and would do away with one of the most serious difficulties in the way of ventilation; but until doors can be given the power of calculating, or each person is provided with an air-bag, I fear it cannot be.

Again, why should Mr. Smith's apparatus be imbued with reason more than any of the other exhausts invented, and be capable of exerting its energies according to the work required of it? If it be the case that it does so, Mr. Smith has proved that that which was considered inanimate is animate.

During the time that I was in the room, as further proof of the marvels performed by this apparatus, a series of gas-burners were lighted; and although the room is only about $15 \times 12 \times 10$, and the exhaust of a sufficient size for a room (according to Mr. Barnes Austin) $40 \times 40 \times 15$, the temperature increased at quite as rapid a rate as I have known it in rooms unventilated, and the air had as vitiated and exhausted a feel as in the most stuffy and unventilated drawing-room.

WALTER HENRY DRAKE,
Civil Engineer.

Bognor, April 10, 1885.

DRAINAGE VENTILATION.

Messrs. Sharp's system of 'house-drain ventilation' and illustrative diagram (No. 2) is nearly a facsimile of one I saw at the International Health Exhibition, hung up over Stand No. 468, Class 22, South Annexe. The only difference is that the anti-vacuum pipes to the closets are extended direct into the soil-pipe, which I think is a bad arrangement, as the soil passing from the upper closet is liable to choke them up. Secondly, a 'single' instead of a 'double' main trap. If sewer-gas is absorbed or driven by pressure into the house-drain, what becomes of the 'single' trap. It is immediately blown out, and sewer-gas passes freely into the system. Surely a trap that effectually keeps it out, which the 'double' trap does, is far preferable, never mind how complete a system of ventilation you have. With the exception of these two matters the diagram was exactly similar in principle, application, and illustration.

Bristol, March 27, 1885.

H. C. B.

THE VENTILATION OF HOUSE-DRAINS.

Upon reading Sharp & Co.'s illustrated paper upon a system of house-drainage ventilation in your issue of March 15, it struck me that sanitary schemes, like history, often repeat themselves. I suppose it can hardly be otherwise, for Solomon in his wisdom said there was nothing new under the sun; but although I claim, myself, to be the original inventor of the system illustrated in your paper, and shown as the double check system, I daresay if a search were made houses have been fitted in the same manner years and years ago; if so, I must content myself by claiming the merit of restoring a good system.

If your readers waded occasionally through the early numbers of the *Builder* paper, they would be surprised to find that many appliances—such as traps, single and double, air-pipes, syphonage, drain-ventilation, and other matters that are continually cropping up every day as novelties—have all appeared in that journal. The

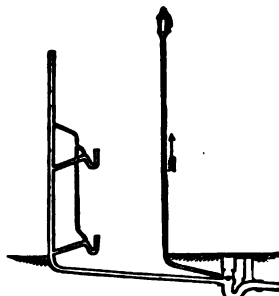
Builders of 1846 and 1847 are especially interesting, and many of the papers that appeared in those years could hardly be better written in the present day; but we are so slow to learn, and so deficient in observation. Coming back to where I started, Messrs. E. & F. N. Spon published for me in 1876 a small book entitled 'An Architect's Letter about Sewer-gas and House-drainage,' which passed through two editions, but is now out of print, and a more full description has since been published, and I enclose copies, and if you compare them with Sharp & Co.'s drawings, you will see that the principle claimed is identical to that illustrated by me. I admit that, reading my book by the light of the present day, I find that it may have been better and more fully expressed; but the principle of a U-shaped arrangement is unmistakable, and this, taken with my letter in your issue of Jan. 15, page 338, will make very clear that the action in a downcast or soil-pipe has been anticipated, not only by my publication, but by actual examples in operation many years before my first book was published. Experience has proved that the system is not continuous, but intermittent. Upon the principle of giving credit to whom credit is due, I trust you will find room for this letter.

Clifton, March 26, 1885.

HENRY MASTERS.

'A NEW DEPARTURE IN HOUSE-DRAINAGE'

I think Mr. Ebbetts, on p. 427, makes some mistakes. He refers to his article on p. 253 as a 'humble contribution.' I think he might with more truth have used another adjective. He also says I am the 'maker' of a certain trap. Now I am not the maker, but the patentee of it. Mr. Ebbetts, in trying to still hold forth his supposed 'new departure' as an original idea, discovered a few months since by himself, says that in cases he has inspected his new departure was only applied to the soil-pipe and not to the drain. But had he looked at my March 1883 drawing he would have seen that I illustrated the principle as applied to both drain and soil-pipe, and in the way he has done, only I prefer, when allowed to do so, to keep the waste-water pipes from sinks and basins apart from the soil-pipe. I here give a sketch of my



Ventilation with the Stream.

1883 drawing, which can be compared with Mr. Ebbetts on p. 253, when it will be seen that I showed how the fresh air could be carried down the soil-pipe and along the drain, and then up a special blow-off ventilating pipe led back from the house side of the interceptor trap, which pipe is surmounted by an exhaust ventilator, all as Mr. Ebbetts now also shows. I would not like, however, to mislead people by hinting that the water-traps at the closets and sinks, &c., are superfluous, as Mr. Ebbetts virtually does on p. 386, when he says, 'I was convinced that if the traps were emptied there would always be a current of air passing from the house down the waste-pipe.' Now, I am convinced that that idea is wrong, and Mr. Ebbetts has been misled by his experiments not being properly and more fully conducted.

Glasgow, March 31, 1885.

W. P. BUCHAN.

THE DOGMATISM OF SANITARY REFORMERS.

The criticism of the Model By-laws under the above heading by Mr. Ebbetts on p. 397, although smart in some respects, is, on the whole, rather superficial. Laws have to do with generalities, and require to be dogmatic. 'Thou shalt not kill' is a law which all may be said to agree to—at least in a civilised country. Mr. Ebbetts, however, objects to this as being too dogmatic, on the plea that in certain exceptional circumstances it may be necessary to kill, and not be fairly unlawful so to do. The circumstances, however, require to be really exceptional, and so with Mr. Ebbetts' objection to the dogmatism of the Model By-laws in asserting or recommending that cisterns used for closets should not be also used as drinking-water cisterns.

To most sanitary plumbers Mr. Ebbetts' question 'whether it were not permissible to connect a valve water-closet direct from a drinking-water cistern?' would likely meet with a negative reply, as the expression 'valve water-closet' would generally call up the idea of a Bramah or some other water-closet, with a valve on its outlet, and with a valve inside the cistern for its supply. With this latter there is danger, as referred to in the Model By-laws, of bad air going up the service-pipe, and of water in the cistern being contaminated by water washed into it through the air-pipe when the valve is opened. There are thousands of various sorts of closets so fitted up throughout the kingdom. What Mr. Ebbetts meant by a valve water-closet was one with a cock below the seat, the service-pipe to which came from a cistern. In this special case there would not be the same chance, of course, as Mr. Ebbetts has explained, of bad air going up the service-pipe. There is still, however, the same risk of contamination from other causes connected with the use of water-closets, and one which in many cases is the most dangerous, viz., that the closet-cistern in one flat or house is often right underneath the closet above, and so is liable—as has happened in thousands of instances—to be fouled by the urine and fæces from the closet above. People have so often unknowingly drunk this fouled water that the framers of the Model By-laws deserve our earnest thanks for a little extra precaution here, instead of the captious criticism awarded them by Mr. Ebbetts. For all he knows, this By-law he attempts to ridicule may have saved his own life. But ingratitude is as old as the hills.

W. P. BUCHAN.

PARKS AND OPEN SPACES.

'God Almighty first planted a garden, and indeed it is the purest of all pleasures.'

MISS DUTHIE, of Ruthrieston, who munificently gave the Duthie Park to Aberdeen at a cost of £60,000, died at the end of last month, and by her will bequeathed £2,000 towards the maintenance of the park, and £1,000 towards the formation of a carriage drive along the bank of the River Dee.

Considerable progress has been made by the Corporation of South Shields in laying out the Marine Park at the entrance to the River Tyne, which when completed will make this one of the most enjoyable and popular resorts on the north-east coast—a fact already appreciated by discriminating visitors. Few towns have made such a rapid extension in house-building as South Shields has done within the last few years, and happily convenience and taste has not been ruthlessly sacrificed to economical expediency. The business premises recently erected in the Queen Anne style at the corner of the Market Place and King Street, as well as others in the same street, may fairly challenge comparison for good workmanship and artistic taste in design with any similar buildings erected elsewhere in the kingdom.

The Corporation of Newcastle has formed a skating pond out of the old reservoirs belonging to the water company, and situate on the Town Moor. The lake is pear-shape, and covers about 1½ acres.

SANITARY JOTTINGS.

YELLOW FEVER ON A WEAR STEAMER.—The screw-steamer *Rimpha*, of Sunderland, arrived in the Tyne on the 6th inst. The captain reports that yellow fever broke out on board during the outward voyage, resulting in six deaths. On arrival in the Tyne the vessel was boarded by the officers of the Port Sanitary Authority, who took possession of the clothes of the deceased men for the purpose of disinfection.

PENNY DINNERS.—The Rev. W. Moore Ede, the rector of Gateshead, has purchased the old Primitive Methodist Chapel in Nelson Street, Gateshead, with the intention of converting it into a cheap restaurant.

EXCESSIVE INFANTILE MORTALITY IN SUNDERLAND AND NEWCASTLE.—Considerable alarm is felt in both Sunderland and Newcastle at the continued spread of the epidemic of measles, which is now very prevalent in both these towns, particularly the former, where the death-rate for the past few weeks has exhibited a very high average, more than once reaching 40 in 1,000. The authorities are doing all they can to prevent the spread of the epidemic, but, unfortunately, their best efforts are too often thwarted by the gross ignorance or culpable neglect of parents, who persist in continuously and needlessly exposing their children to the risk of infection. The School Board cannot be held entirely blameless in the matter, as their earnest co-operation is necessary in support of remedial measures for the prevention of the spread of the disease. Unfortunately School Boards, as a rule, do not seem fully alive to their grave responsibility in these matters.

NOTICES OF MEETINGS.

THE PARKES MUSEUM,

74A Margaret Street, W.

SIR SPENCER WELLS, Bart., will deliver an address on 'Cremation,' at the Parkes Museum, on Thursday, April 23, at eight o'clock. The chair will be taken by the Right Hon. the Earl of Shaftesbury, K.G.

VACCINATION OFFICERS' ASSOCIATION.

THE next meeting of members of this Association will be held on Saturday, April 18, at 2.30 P.M., at the Charing Cross Hospital Medical School, 62 Chandos Street, Strand, W.C. *Agenda.*—1. To read minutes of last meeting. 2. Correspondence. 3. Report of committee. 4. Election of members and honorary members. 5. To consider the best means of securing the vaccination of children born in public institutions. 6. To discuss recent events in opposition to vaccination.

C. O. ELKERTON, Hon. Sec.

COMPETITIONS.

THE POLLUTION OF RIVERS.

THE Royal Academy of Sciences of Belgium has issued a notice with reference to an extraordinary competition for the year 1887. The Government has proposed, and the Chambers have adopted a law having for its object the preservation of fish and their restoration to the rivers. The main obstacle to this end is the pollution of the waters of small unnavigable streams by solid and liquid matter poured into them by various industries, which render them unfit for the breeding and existence of fish. The Academy, therefore, calls on science to aid the public authorities. One of its members has placed at its disposal the sum of 3,000 francs, which it has decided to spend in giving a prize for a thorough study of the following questions, at once biological and chemical:—(1) What are the special substances in our principal industries which, when mingled with the water of small streams, render them incompatible with the existence of fish and unfit for the consumption of man and beast? (2) Investigation and indication of practical measures for purifying water as it leaves manufactories, so as to render it innocuous to fish without interfering with the industry, combining the expedients offered by decanting basins, filtering and chemical agents. (3) Separate experiments on the substances which in each special industry kill fish, and on the degree of resistance which each species of edible fish offers to this destruction. (4) A list of the rivers in Belgium which are actually depopulated by this state of things, with an indication of the special industries in these rivers, and a list of the edible fish which inhabited them before the establishment of the factories. If a memoir is judged satisfactory for the solution of the two first points, a prize of 2,000 francs will be given, even though the two latter questions are untouched. Papers should be legibly written, and should be addressed to M. Liagre, Perpetual Secretary, au Palais des Académies.

Brussels, before October 1, 1887. Quotations are to be made with great exactness, and authors should therefore mention the edition and page of works cited. A motto must be selected, and the names included in a separate sealed envelope, with the motto superscribed. The papers sent in will remain in the archives of the Academy.

APPOINTMENTS.

MEDICAL OFFICERS OF HEALTH.

ANDERSON, William H., M.B.C.M.Univ.Glasg., has been re-appointed Medical Officer of Health for the Hoxne Rural Sanitary District, Suffolk, at £65 for one year.

BROWNE, George Henry, L.R.C.P.Edin., and L.M., L.F.P.S. Glasg., L.A.H.Dub., has been appointed Medical Officer of Health for the Brynmawr Urban Sanitary District, at £40 for one year, *vice* Skrimshire.

BYLES, Henry, M.B., C.M.Univ. Edin., has been appointed Medical Officer of Health for the Eccleshill Urban Sanitary District, Yorkshire, at £40 per annum for three years, *vice* Aston, resigned.

CARSON, Stewart, M.B., C.M.Univ. Edin., has been re-appointed Medical Officer of Health for the No. 1 Division of the Alston-with-Garrigill Rural Sanitary District, Cumberland, at £20 for one year.

COLLINGRIDGE, William, M.D., S.S.Cert.Cantab., has been re-appointed Medical Officer of Health for the London Port Sanitary District for the ensuing year.

COVERNTON, Charles James, L.R.C.P.Edin., M.R.C.S.Eng., has been re-appointed Medical Officer of Health for the Knighton Urban Sanitary District, Radnorshire, at £20 for one year.

EATON, James William, L.R.C.P.Lond., M.R.C.S.Eng., has been re-appointed Medical Officer of Health for the Bingham Rural Sanitary District, at £50 for one year.

FOSTER, Henry George, L.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Guiltcross Rural Sanitary District, Norfolk, at £40 per annum, *vice* Gurdon, resigned.

GARLIKE, Edward William Bennett, L.R.C.P.Edin., M.R.C.S.Eng., has been re-appointed Medical Officer of Health for the Cheshunt Urban Sanitary District, at £45 for one year.

HARDWICKE, Ernest Henry, L.R.C.P.Edin., and L.M., L.R.C.S. Eng., and L.M., has been re-appointed Medical Officer to the Hospital for Infectious and Contagious Diseases of the Solihull Rural Sanitary Authority, Warwickshire, at £50 for one year.

HARPER, Robert, L.R.C.P.Edin., M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Holbeach Urban Sanitary District, at £15 for one year, *vice* Robert Russell Harper, L.R.C.P.Lond., M.R.C.S.Eng., L.S.A.Lond., resigned.

HERBERT, Johnson, L.R.C.P.Edin., L.R.C.S.Eng., has been appointed Medical Officer of Health for the Whitby Urban Sanitary District, at £25 per annum, and for the No. 1 Division of the Whitby Rural Sanitary District, at £35 per annum, *vice* John Taylerson, L.R.C.P.Edin., M.R.C.S.Eng., deceased.

HERRING, John Francis, L.R.C.P.Edin., L.R.C.S.Eng., S.S.Cert. Cantab., has been re-appointed Medical Officer of Health for the Bulth Rural Sanitary District, at £30 for one year.

JACKSON, Thomas, L.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Holbeach division of the Holbeach Rural Sanitary District, Lincolnshire, at £20 for one year, *vice* Harper, resigned.

JONES, William Rees, M.B.C.M.Univ.Glasg., has been re-appointed Medical Officer of Health for the No. 2 division of the Brecknock Rural Sanitary District, at £40 for one year.

KENVON, George Arthur, M.B.Univ.Lond., L.R.C.P.Lond., M.R.C.S.Eng., has been re-appointed Medical Officer of Health for the Chester Port Sanitary District, at £20 for one year.

MACKINTOSH, Angus, M.D.Univ.Glasg., L.F.P.S.Glasg., and L.M., has been re-appointed Medical Officer of Health for the Chesterfield Rural Sanitary District, at £400, for the Newbold and Dunston Urban Sanitary District, at £36, and for the Dronfield Urban Sanitary District, at £20, all for one year.

MARSHALL, John Ingham Fearby, M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the York Rural Sanitary District, at £80 for one year.

MASTERTON, John, M.B.Univ. Edin., L.R.C.P.Edin., L.R.C.S. Eng., has been appointed Medical Officer of Health for the No. 2 Division of the Alston-with-Garrigill Rural Sanitary District, at £20 for one year, *vice* Walker, whose appointment has expired.

MURPHY, William Ponsonby, L.R.C.S.Irel., and L.M., L.A.H.Dub., has been re-appointed Medical Officer of Health for the Wigton Rural Sanitary District, at £80 for one year.

NORMAN, John William, L.R.C.P.Edin., L.R.C.S.Eng., has been re-appointed Medical Officer of Health for the Ross Urban Sanitary District, at £15 for one year.

PRIEST, James Damer, M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer of Health for the Waltham Holy Cross Urban Sanitary District, at the rate of £30 per annum, until Sept. 29 next, *vice* Arthur Priest, L.R.C.P.Edin., M.R.C.S. Eng., L.S.A.Lond., resigned.

REES, David Valentine, L.R.C.P. Lond., M.R.C.S.Eng., has been re-appointed Medical Officer of Health for the No. 1 division of the Brecknock Rural Sanitary District, at £40 for one year.

RENTON, William, L.R.C.P.Edin., L.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Knaresborough and Tentergate Urban Sanitary District, at £60 for one year.

ROBERTSON, John, M.D.Univ. Edin., L.R.C.S.Eng., and L.S.A.Lond., has been re-appointed Medical Officer of Health for the Cocke Rural and Urban Sanitary Districts, at £150 and £40 per annum.

SHADWELL, St. Clair Brockway, L.R.C.P.Lond., M.R.C.S.Eng., has been appointed Medical Officer of Health for the Wistow Urban Sanitary District, at £75 per annum, *vice* resigned.

SMITH, Mr. Edward James, Manager of the Bridlington Branch of the York City and County Banking Company, has been appointed Treasurer to the Bridlington Guardians and Rural Sanitary Authority, *vice* Harding, resigned.

SMITH, William John, L.R.C.P.Edin., and L.M., L.R.C.S. Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Rawmarsh Urban Sanitary District, Yorkshire, for one year.

VERITY, Abraham John, M.R.C.S.Eng., has been re-appointed Medical Officer of Health for the Bridgend Urban Sanitary District, at £25 for one year.

WHITCOMBE, Philip, M.R.C.S.Eng., L.S.A.Lond., has been appointed Medical Officer to the London Port Sanitary District, Infectious Diseases Hospital, Gravesend, for the ensuing year.

WILLIAMS, James, F.R.C.S.Eng., has been re-appointed Medical Officer of Health for the No. 3 division of the Brecknock Sanitary District, at £40 for one year.

WOTHERSPOON, Thomas Allan, M.D.Univ. Edin., L.R.C.S. Eng., has been re-appointed Medical Officer of Health for the Knighton Rural Sanitary District, Cumberland, at £60 for one year.

YATES, James, M.R.C.S.Eng., L.S.A.Lond., has been re-appointed Medical Officer of Health for the Newcastle-under-Lyme Urban Sanitary District, at £40 for one year.

PUBLIC ANALYSTS.

ALLEN, Mr. A. H., has been re-appointed Public Analyst for the Borough of Sheffield for one year.

HEISCH, Mr. Charles, has been re-appointed Public Analyst for the Parish of St. John, Hampstead, at £50 for one year, *vice* analysis of Food or Drugs up to fifty, and 5s. each beyond 42s. for each analysis of Water.

SURVEYORS, CLERKS TO GUARDIANS, INSPECTORS OF NUISANCES, &c.

BARTLETT, Mr. Robert V. O., has been appointed Surveyor of Highways and Inspector of Nuisances for the Wilton Rural Sanitary District, at £105 and £60 per annum, *vice* Matthews.

BISHOP, Mr. William, has been re-appointed Inspector of Nuisances for the Elham Rural Sanitary District, Kent, at £10 per annum.

BLOOD, Mr. John, has been re-appointed Inspector of Nuisances for the Newcastle-under-Lyme Rural Sanitary District, at £10 per annum.

BOOR, Mr. G. C., has been elected a Member of the Horsey Board and Urban Sanitary Authority.

BOWEN, Mr. Edward Palmer, Bank Manager, has been appointed Treasurer to the Leominster Guardians and Rural Sanitary Authority, *vice* Daggs, deceased.

CHATHAM, Mr. John Parke, Solicitor, has been appointed Clerk to the Sculcoates Guardians and Rural Sanitary Authority, at £200 per annum as Clerk to the Guardians, £4 per annum as Clerk to the Rural Sanitary Authority, such remuneration as Clerk to the Assessment Committee and School Attendance Committee as may be fixed from time to time and fees as Superintendent Registrar of Births, &c., and Acting Officer, *vice* Mr. William Chatham, deceased.

COOPER, Mr. John Richmond, has been appointed Town Clerk to the Urban Sanitary Authority of Walsall, at £4 per annum, and £125 per annum for clerks, *vice* Wilkinson.

COWDEROY, Mr. John Tatem, has been appointed Inspector of Nuisances for the Kidderminster Urban Sanitary District, at £125 per annum from year to year, *vice* West.

CROSTHWAITE, Mr. Joseph, has been re-appointed Inspector of Nuisances for the Wigton Rural Sanitary District, at £10 per annum.

DARLINGTON, Mr. Ralph, Solicitor, has been appointed Town Clerk to the Urban Sanitary Authority of Wigan, at £10 per annum and costs out of pocket, with offices, *vice* resigned.

DAVY, Mr. John, has been re-appointed Inspector of Nuisances for the Hoxne Rural Sanitary District, Suffolk, at £60 for one year.

FISKE, Mr. William, Bank Manager, has been appointed Town Clerk to the Chepstow Local Board and Urban Sanitary Authority to the Chepstow Guardians and Rural Sanitary Authority, *vice* Horsey, resigned.

HARDAKER, Mr. Samuel, has been appointed Collector for the Eccleshill Local Board and Urban Sanitary Authority, at 10 cent. commission, *vice* Metcalfe, deceased.

HARPUR, Mr. S., who will resign as Surveyor to the Merthyr Local Board and Urban Sanitary Authority in June, has been appointed Consulting Engineer, at £150 for one year from date.

HARSTON, Mr. William, has been appointed Surveyor, Inspector of Nuisances, Collector, and Superintendent of the Cemetery, Guisborough Local Board and Urban Sanitary Authority, at £120 for one year, *vice* Hyslop and Metcalfe.

HARVEY, Mr. Thomas Fletcher, has been appointed Engineer and Surveyor to the Merthyr Tydfil Local Board and Urban Sanitary Authority, at £120 for one year, *vice* Hyslop and Metcalfe.

Authority, at £350 per annum, with the assistance of a book-keeper and the use of a horse, *vice* Harpur, resigned, and appointed Consulting Engineer.

CLIFFE, Mr. H., has been appointed Surveyor to the Worksop Local Board and Urban Sanitary Authority, at £150 per annum, with office, *vice* Turnbull.

CLIFFE, Mr. William, has been appointed Collector to the Swindon New Town Local Board and Urban Sanitary Authority, at £100 per annum, *vice* Mr. John William Jolliffe, deceased.

CRISDEN, Mr. Henry, has been appointed Surveyor and Inspector of Nuisances to the Sowerby Local Board and Urban Sanitary Authority, Yorkshire, *vice* Lumb, resigned.

CRISON, Mr. William, has been appointed Surveyor and Collector to the newly-formed Ambleside Local Board and Urban Sanitary Authority, at £31 per annum.

CRISSEN, Mr. Edward Lomas, has been appointed Surveyor to the Belgrave Local Board and Urban Sanitary Authority, at £75 per annum, *vice* Draper, resigned.

CRISSEN, Mr. George Bellamy, Solicitor, has been appointed Town Clerk and Clerk to the Urban Sanitary Authority of Huddersfield, at £800 per annum, clear, with offices and clerks, *vice* Batley, deceased.

CRISSEN, Mr. William Robert, has been appointed Surveyor of Highways for the No. 2 Division of the Elham Rural Sanitary District, Kent, at £90 per annum.

CRISSEN, Mr. John, has been re-appointed Inspector of Nuisances for the Birmingham Urban Sanitary District, at £200 per annum.

CRISSEN, Mr. James, has been appointed Inspector of Nuisances for the Runcorn Urban Sanitary District, at £100 for one year, *vice* Barker.

CRISSEN, Mr. James, has been re-appointed Inspector of Nuisances for the Brampton Rural Sanitary District, Cumberland, at £40 for one year.

CRISSEN, Mr. Thomas, has been re-appointed Inspector of Nuisances for the Guildford Rural Sanitary District, at £130 for one year.

CRISSEN, Mr. William, has been appointed Collector to the Northfleet Local Board and Urban Sanitary Authority, at 5d. in the pound commission, *vice* Sunnucks, resigned.

CRISSEN, Mr. John, jun., has been appointed Surveyor to the Matlock Local Board and Urban Sanitary Authority, at £100 per annum, *vice* Bourne, appointed Surveyor and Inspector of Nuisances to the Shepton Mallet Local Board and Urban Sanitary Authority.

CRISSEN, Mr. George, has been re-appointed Inspector of Nuisances for the York Rural Sanitary District, at £120 for one year.

CRISSEN, Mr. David, has been re-appointed Collector to the Louth Town Council and Urban Sanitary Authority, at 4d. in the pound commission.

CRISSEN, Mr. John T., has been re-appointed Inspector of Nuisances for the Leominster Rural Sanitary District, at £70 for one year.

CRISSEN, Mr. Thomas Lloyd, has been appointed Inspector of Nuisances for the Bulth Rural Sanitary District, at £25 for one year.

CRISSEN, Mr. Septimus James, Solicitor, has been appointed Town Clerk and Clerk to the Urban Sanitary Authority of Bury, Lancashire, at £400 per annum, with offices and clerks, *vice* Bull, resigned.

CRISSEN, Mr. Joseph, has been re-appointed Inspector of Nuisances for the Alston-with-Garrigill Rural Sanitary District, Cumberland, at £20 for one year.

CRISSEN, Mr. Henry, has been re-appointed Inspector of Nuisances for the Millom Urban Sanitary District, at £80 for one year.

CRISSEN, Mr. Harry Wray, has been appointed Sanitary Surveyor and Inspector of Nuisances for the Chesterfield Rural Sanitary District, at £150 per annum, from year to year, *vice* Butterworth, resigned.

CRISSEN, Mr. Hugh, has been re-appointed Inspector of Nuisances for the Chester Port Sanitary District, at £10 for one year.

CRISSEN, Mr. John, has been appointed an Assistant Inspector of Nuisances for the Blackpool Urban Sanitary District, at £60 per annum.

CRISSEN, Mr. Samuel, upon resigning as Town Clerk and Clerk to the Urban Sanitary Authority of Walsall, has been appointed Legal Adviser, at £200 per annum.

CRISSEN, Mr. Evan, has been re-appointed Inspector of Nuisances for the Bridgend Urban Sanitary District, at £30 for one year.

CRISSEN, Mr. George, has been appointed Surveyor of Highways for the No. 1 Division of the Elham Rural Sanitary District, at £110 per annum.

CRISSEN, Mr. John Wilkinson, has been re-appointed Inspector of Nuisances for the Bingham Rural Sanitary District, at £70 for one year.

VACANCIES.

MEDICAL OFFICER OF HEALTH AND EXAMINER OF GAS for the Parish of St. Pancras, Middlesex: £300 per annum. Application, 16th inst., to T. E. Gibb, Vestry Clerk, Pancras Road.

MEDICAL OFFICER OF HEALTH for the Portsmouth Urban Sanitary District. Application to Alexander Hellard, Town Clerk.

MEDICAL OFFICER OF HEALTH for the Mutford and Lothingland Rural Sanitary District, Suffolk: £50 per annum. Application to T. S. Allerton, Clerk to the Authority, Lowestoft.

PUBLIC ANALYST for the Borough of Nottingham. Application to Samuel G. Johnson, Town Clerk.

CLERK to the Pudsey Local Board and Urban Sanitary Authority. Application, stating salary required, 20th inst., to J. A. Lawson, Clerk.

SURVEYOR for the East Kensington District, under the Metropolitan Building Act, 1885. Application, 22nd inst., to J. E. Wakefield, Clerk to the Metropolitan Board of Works, Spring Gardens.

SURVEYOR AND WATER WORKS MANAGER to the Frome Local Board and Urban Sanitary Authority. Application to G. W. Bradbury, Clerk.

SURVEYOR to the Longwood Local Board and Urban Sanitary Authority. Application to W. H. Taylor, Clerk, Golcar, near Huddersfield.

SURVEYOR to the Broadstairs and St. Peter's Local Board and Urban Sanitary Authority. Application to W. S. Barwick, Clerk.

REPORTS OF PUBLIC ANALYSTS.

MR. OTTO HEHNER, the Public Analyst for the Southern Division of the county of Derby, in his last quarterly report stated that the total number of samples analysed during the quarter was nineteen, viz., seventeen of milk, one of butter, and one of coffee. The number of samples adulterated was four, viz., three of milk and one of butter. Mr. A. H. Allen, for the Northern District, reported on sixteen samples. Of two of butter, one was genuine, while the other consisted of butterine. A sample of coffee was found to consist of a mixture of coffee and chicory. A specimen of gin proved to be adulterated with water. Of three samples of milk two were adulterated with water, while one was of suspiciously poor quality, but scarcely had enough to justify its condemnation as adulterated.

Mr. T. A. Pooley, the Public Analyst for Essex, in his report for the last quarter, stated that during the past three months ninety-eight samples of food and drugs had been submitted to him for analysis by the following persons:—Inspectors in the fourteen districts of the county, fifty-nine samples; Inspector Metropolitan Police District, thirty-eight; private individual, one; total, ninety-eight. There was a very considerable diminution in the number of cases of adulteration. Of the ninety-eight samples analysed only thirteen were adulterated—viz., twelve of milk and one of gin. The percentage of adulterated samples had thus fallen to the lowest point Mr. Pooley had yet had to record, a satisfactory result no doubt largely due to the persistent purchase of samples by the respective district inspectors. The rural districts of the county now appeared to be almost free from adulteration, but in the metropolitan district a very large proportion of the milks tested (twelve in thirty-eight) were found to be diluted with water.

Mr. W. W. Fisher, the Public Analyst for Oxfordshire, in his report for the last quarter stated that he had analysed twelve samples of bread, three of lard, and one of coffee, in all sixteen samples, which were brought to him by the Inspector of the Headington Rural Sanitary Authority. Five samples of bread were found to contain alum in proportions varying from 25 to 40 grains per 4 lb. loaf. The specimens of lard were all pure, but the coffee contained 10 per cent. of chicory. He had examined eight samples of well water from localities within the county, of which three were unfit for use as drinking water. Two specimens of wall paper sent to him for analysis were found to contain considerable quantities of arsenic.

LOCAL INTELLIGENCE.

THE Rawmarsh Local Board and Urban Sanitary Authority appointed Mr. James Whitehead, jun., Inspector of Nuisances, *vice* Train, resigned (see SANITARY RECORD for Aug. 15, 1883, p. 96), and re-appointed him for one year in June 1884 (see page 619); but it appears that the Local Government Board did not confirm either appointment; and they have now written to the Authority stating that as they had decided that Mr. George Train had been appointed for the three years ending March 1885, no one else could be elected until after the date named, and they could not, therefore, sanction the repayment of any portion of his salary out of the Parliamentary grant for the half-year ending Michaelmas last.

The Torrington Town Council and Urban Sanitary Authority have increased the salary of the Surveyor £30 per annum.

At the meeting of the Carmarthen Guardians and Rural Sanitary Authority on March 21, Mr. J. Hughes in the chair, a solid silver salver and an illuminated address were presented to Mr. John Lewis Philipps, upon his resigning as chairman, each bearing the following inscription:—Presented to J. L. Philipps, Esq., of Bolahaul, late chairman of the Carmarthen Board of Guardians, on his resignation of that office, by his fellow-guardians and other friends, in recognition of the assiduity, ability, and courtesy with which he conducted the proceedings of the Board for twenty-three years.

The Westbury-on-Severn Guardians and Rural Sanitary Authority, at their meeting on March 24, upon the motion of the vice-chairman, seconded by Sir T. Crawley Boevey, passed the following resolution unanimously:—'That this Board, having heard with great regret, the announcement of Major Probyn that, as his residence in the county is about to cease, he will be unable to continue the chairmanship of the Board, to which he has been successively elected during the past ten years, begs to record its sense of the patience, courtesy, and ability with which he has uniformly conducted the business of its meetings during his term of office; and further, that the above resolution be entered on the minutes of the proceedings of the Board.'

The Llandysilio or Menai Bridge Local Board and Urban Sanitary Authority have increased the salary of Mr. Thomas Hughes, their clerk, from £40 to £60 per annum, upon the understanding that he takes charge of the Water-works.

The Leominster Guardians and Rural Sanitary Authority, at their meeting on the 3rd inst., passed the following resolution unanimously:—'That a vote of thanks be given to Dr. Sandford, as Medical Officer of Health for the past twelve years, in recognition of the valuable services rendered by him in the reduction of the death-rate in this and other authorities in the county.'

The Port of London Sanitary Committee entertained the Lord Mayor and Sheriffs and a numerous company at dinner on March 24. Mr. W. A. Plunkett, the chairman of the current year, presiding, after which Mr. Washington Lyon, the late chairman, was presented with a silver biscuit box and dish, contributed for by the members of the committee, as a small token of esteem, and approval of the manner in which he had discharged the duties of his office.

We reported the position of the apparently interminable discussion as to the salary of Dr. Mackintosh, Medical Officer of Health for the Chesterfield Rural Sanitary District, in page 392. At a subsequent meeting a letter was read from the Local Government Board, adhering to their previous decision not to recommend the repayment by the Treasury of half the salary if it were reduced below £400. It was then agreed to adjourn the matter until the next meeting, and the clerk was instructed to write to the various Local Boards in the district to ascertain whether they would be willing to appoint the same gentleman as the authority, so as to make his total salary £350—£200 from the Authority, and £150 from the Local Boards. One of them, the Dronfield Local Board and Urban Sanitary Authority, promptly put their veto on the proposal; for at their meeting on March 11, upon the reading of the letter from the clerk to the Chesterfield Rural Sanitary Authority, they unanimously condemned the action taken by the Chesterfield Rural Sanitary Authority, as Dr. Mackintosh had discharged the duties of medical officer of health in the most efficient and satisfactory manner. The result of such interference, and the appointment of another officer, would be—if sanctioned, as requested—a considerable increase in the amount paid by the Board towards the medical officer of health's salary. It was resolved:—'That the Clerk of the Board inform the Rural Sanitary Authority that the Board unanimously declined to sanction the appointment of another medical officer of health in place of Dr. Mackintosh, and greatly regretted the action they had taken in the matter.' The other Urban Sanitary Authorities also deprecated the action of the Rural Sanitary Authority, the result being that Dr. Mackintosh has now been re-appointed by the Chesterfield Rural, and the Newbold and Dunston and Dronfield Urban, Sanitary Authorities for one year, as reported in another column.—The Whitlington appointment will not expire until June next, the Brampton and Walton until March 1886, and the Clay Lane until April 1886.

The Northfleet Local Board and Urban Sanitary Authority have increased the salary of Mr. S. Honeycombe, the Surveyor, to £150 per annum, and that of Dr. John E. Crook, the Medical Officer of Health, to £50 per annum (from £30).

The Sevenoaks Local Board and Urban Sanitary Authority have increased the salary of Mr. Amos Pett, the Collector, from £60 to £70 per annum.

The West Worthing Improvement Commissioners and Urban Sanitary Authority have increased the salary of Mr. W. W. Smith, the Clerk, from £50 to £100 per annum, in consequence of the great increase of his duties, as evidenced by the fact of the rateable value of the district having more than doubled since his appointment in 1876.

A deputation from Churwell, representing ratepayers and owners, waited upon the Town Council and Urban Sanitary Authority of Leeds at their Quarterly Meeting on the 1st inst., in support of an application already made, asking if the Corporation would be willing to incorporate the township of Churwell as a portion of the borough, and, if so, on what terms. The deputation comprised Mr. Benjamin Keightley, the chairman, Mr. Gill Armitage and Mr. John Walker Wood, members, and Mr. Steward, clerk, of the Churwell Local Board; and Mr. John Burton and Mr. William Cheesborough, representing the ratepayers. On the motion of Alderman Emsley, the question was referred to the Parliamentary Committee.

Mr. Arthur Birks, the Chairman of the Fenton Local Board and Urban Sanitary Authority, stated, at the meeting on Tuesday, the 31st ult., that he should like to leave behind him some memento of his connection with the Authority, upon the expiration of his three years as Member; and begged their acceptance of a flag and flag-staff. He was thanked for his offer, which was accepted, and the Surveyor was instructed to make arrangements for the fixing of the flag-staff on the Public Hall.

The Warrington Guardians and Rural Sanitary Authority have been invested with the rights, powers, &c., of an Urban Sanitary Authority under Sects. 157 & 158 of the Public Health Act, within the contributory places of Rixton-with-Glazebrook, and Cuedley. The Order is to come into operation on the 21st inst.

At a special meeting of the New Swindon Local Board and Urban Sanitary Authority on the 28th ult., to appoint a Summoning Officer in the place of Mr. James Copleston Townsend who had died suddenly, Mr. James Holden, the Chairman, said he thought that before proceeding to business he should be consulting the wishes of every member by proposing the following resolution:—'This Board desires to record its sense of the loss it has sustained by the death of Mr. J. C. Townsend, who has, from the formation of the Board, acted as Clerk and Legal Adviser, and to express its profound sympathy with Mrs. Townsend and the members of the family.' The resolution, being formally seconded, was carried unanimously; and a copy of it was directed to be sent to Mrs. Townsend.

NOTES AND QUERIES.

Having for some time back been in the receipt of Queries relating strictly to sanitary work, and which it would be easy to answer without having to refer our correspondent to competent professional advisers, we have opened a column in which to register such Queries. Replies thereto as can fairly be expected from us; and our subscribers and readers are invited to make such use of this column as will to benefit themselves and the community. Both Queries and Replies will, however, be subjected, if unnecessarily long, to a strict censure.

146. REPRESSION OF ADULTERATION BY LOCAL AUTHORITIES.

The Local Government Board have recently issued a circular to local authorities to procure samples for analysis under the Food and Drugs Act. Will you kindly answer the following questions which arise on that circular:—1. Can a local authority appoint a police constable, under section 13 of the Act of 1875, to procure samples for analysis at his discretion; or must he in a separate case obtain the directions of the local board? 2. Can an inspector of nuisances, under the General Order of May 1880, can procure samples, must his directions from the local authority be renewed in each case; or can the authority authorise him to act whenever he suspects adulteration?

[A general authority appears to be sufficient in the first case in the second special directions must be sought for before an inspector can take action.—Ed.]

147. DEFINITION OF NEW BUILDING.

Please advise whether in the circumstances stated, a re-erected can properly be regarded as a new building subject to the provisions of the by-laws framed on the model of the Local Government Board. The same person is owner of two adjoining houses has pulled down one of the houses to the ground, the part between the houses being left standing. On the site he has built a new house; but, on the ground that the party wall was part of the house pulled down, he has objected to be under the by-laws, relating only to new houses. He made a communication to the old house and the new by a door, and alleged that the was merely an addition to the former; but has now let the house as a separate tenant. The sanitary authority have insisted the house was a new house within the Public Health Act, and require him to comply with the by-laws. Are they within their power compelling the owner to alter it so as to comply with the by-laws?

[Yes. The new building is clearly subject to the by-laws. The fact that there is a mode of communication between it and the old building is not sufficient to exempt it from the operation of the by-laws.—Ed.]

148. DEFINITION OF ANNUAL VALUE.

Please give your judgment as to the proper definition of the 'annual value' in sections 68 *et seq.* of the Waterworks Clauses Act of 1847?

[In attempting to answer this question, some allowance must be made for the wording of the local Act or provisional order relating to the water undertaking in the particular district. It is commonly found that the Act or Order specifically provide that the rates shall be paid according to the 'net annual value,' or other standard. In the celebrated struggle of Mr. Dobbs at the Grand Junction Waterworks Company the House of Lords down that the phrase 'annual value' in that company's private Act meant what it was defined to mean in the Parochial Assessment Act (6 & 7 Wm. IV., cap. 96), viz., 'the rent at which the premises might reasonably be expected to let from year to year, free of usual tenant's rates and taxes and tithe commutation rent-charges, and deducting therefrom the probable average annual cost of the repairs, insurance, and other expenses, if any, necessary to maintain them in a state to command such rent.' Although decision governs only the charges of one particular company, it is taken to have universal application. In the Public Health Act 1875, Section 56, the difficulty is got over by assessing the rate on the 'net annual value,' which is defined by Section 4 words from the Parochial Assessment Act above quoted.—Ed.]

149. HOSPITAL PROVISION BY LOCAL AUTHORITIES.

Section 131 of the Public Health Act, 1875, gives power to local authorities to 'provide for the use of the inhabitants of their hospitals or temporary places for the reception of the sick. Could an authority lawfully provide and maintain a general (infectious) hospital under the powers of this section?

[Section 131 is one of a number coming under the general heading of 'Infectious Diseases and Hospitals,' and would seem, therefore, to apply to infectious hospitals only. But we rather think the authority of a town in Lancashire, where a good many are run by workpeople in factories, has provided an accident hospital out of the rates under the powers of this section; and we have heard of the legality of that act being questioned.—Ed.]

150. THE POLLUTION OF RIVERS.

Can you refer me to any source where I can read the full of medical evidence given at the late trial against the Local Board for pollution of a lake or stream? This case is important in a sanitary point, and the evidence given in the papers was very much condensed.

[We do not think the evidence was anywhere reported. No doubt a short-hand note was taken, and the reporter probably agree to publish it, if he thought the public was interested.—Ed.]

ORIGINAL PAPERS.

THE REPORT OF
THE ROYAL COMMISSION ON THE
HOUSING OF THE POOR.

THE long-expected, greatly-canvassed, and much-accounted report of the Royal Commission appointed by Her Majesty to inquire into the Housing of the Working Classes, has at length been given to the world. It is a document of profound and pathetic interest. If it is possible to imagine anybody in these latter days coming to the consideration of the dwellings' problem with an absolutely fresh and uninstructed mind, the perusal of this report would infallibly disturb the nervous centres of such one to an unexpected and even painful extent. But it unfortunately happens that such of the community as had not been already acclimatised by official or philanthropic intermingling with the poor, find their susceptibility to heart-flutters over this question during the great epidemic of popular notion that swept over the country when the 'latter cry' made itself articulate in the autumn of 1883. If the present report, signed by some of the highest-born and clearest-headed in the land, could have taken the place of Mr. Mearns' discursive pamphlet and Mr. Sims' sensational descriptions, as the spark that kindled the flame of national anger, it might by this time have been well on the way towards drastic and organic reforms. The flame is now gone out, however. It will be difficult to light it, impossible to make it blaze again with equal fury. The report of the Royal Commission, arriving at the present juncture, when the fickle public have other things to pre-occupy their vagrant minds, will, of course, be received with a certain morose distaste, as revealing a state of things horrible and shocking; but we much fear that it will not sear, as it ought to do, the conscience of the nation, and rouse it to a determination that, at whatever cost, this plague-spot shall be rooted out of our midst.

Motive Power wanted rather than Legislation.—Here it not for the respect that we owe to the eminent men who compose the Royal Commission, might feel disposed to sum up their report in a single sentence of their own using:—'The Commissioners are of opinion that there has been failure of administration rather than in legislation; what at present time is specially required is some motive power.' This is the key-note of the report. But what to get the motive power? Here the Commissioners are not so helpful as they might be, contenting themselves with the trite remark that 'probably there can be no stronger motive power than public opinion.' And as to public opinion we must wait for the creation of a healthy activity in this matter, it will be necessary to educate it by referring in detail to the Commissioners' recommendations. We pass over the sketch of the existing law on the subject that monopolises the first few pages of the report, which to our mind is inferior to our own summary printed in the SANITARY RECORD of May 15, 1884.* And for much the same reason, that there are ample materials of the kind in our own annals, we treat very briefly the descriptions given of the actual state of things existing as to the dwellings of the poor. It is useful, however, to have this

solemn and official confirmation, under the hand of men of the highest eminence and undoubted integrity, of facts which at the time of their first telling were denounced by the unbelieving public as lurid and distorted phantoms of the imagination. No one can in the future plead ignorance of how the poor live, for lack of unbiased and trustworthy information on the subject. There is enough in the report to condemn every one of us for shameful indolence and laxity in letting things drift until they have reached their present acute stage of misery and disgrace. Let us hope that the bottom has now been reached, and that our public men will find it impossible to relegate this report to the dusty shelf on which repose in undisturbed slumber the recommendations of commissions and committees on a hundred other subjects. Here, however, is a matter which affects the new electors to a very personal and immediate degree, and if they do wisely, they will make the proper housing of the poor a hustings question, to which no Parliamentary candidate, charm he never so wisely, can escape committing himself.

Causes of Overcrowding and Insanitary Conditions.—The central point upon which most of the evidence turned was, of course, overcrowding. But overcrowding is in reality an effect, and not a cause. Lord Shaftesbury, with his unequalled experience of sixty years, declared that, however great the improvement of the poor had been in other respects, 'the overcrowding has become more serious than it ever was.' (See SANITARY RECORD, page 389.) But why? For the reasons amongst others that rents are high, that wages are precarious, that workers must live near their work, that reckless demolitions of poor houses have been made for municipal and railway 'improvements'; that the houses are in the hands of rapacious and unscrupulous middle men, and that local authorities are inert and careless. The consequences of this complication of disasters are not only overcrowding, but bad drainage, imperfect closet accommodation, polluted water supply, filth of person and of habitation, sickness, depression of spirits, intemperance, immorality, and their congeners. All this is thoroughly well recognised and understood by our readers. Let us therefore turn to the recommendations which the Commissioners make for removing all these dangers from the community.

By-laws as to Houses Let in Lodgings.—Sect. 35 of the Sanitary Act of 1866, giving power to sanitary authorities under certain conditions to make by-laws as to houses let in lodgings, has admittedly been more honoured in the breach than in the observance. One vestry clerk probably spoke the mind of many of his fellows when he said that his vestry 'had never turned their attention to the 35th section of the Sanitary Act. Of course it was amongst the Acts in the office, but they had never turned their attention to it, and consequently had never considered the effect of a particular clause' (Q. 17,483). One reason for the little use that has been made of the clause is the necessity for applying to the Local Government Board for an order to put it in force. The Commissioners, in recommending that the metropolitan authorities which have not already made and enforced by-laws should proceed to do so (the Local Government Board having of its own motion declared the clause in force throughout the metropolis at the end of 1883), suggest also that all urban authorities should be empowered to make

* Vol. xv, p. 337.

by-laws without any previous action at Whitehall. The Commissioners are not very sanguine about this recommendation, however, for they remark that 'it is not likely that such action will be taken until the people show a more active interest in the management of their local affairs.'

Consolidation and Amendment of Sanitary Acts.—The Commissioners observe that 'if efforts have been made in Parliament to improve the dwellings of the poor, the result has been to make knowledge as to the remedies for the evils attainable only by a very difficult and elaborate study. . . . It is not surprising that local authorities, who have sometimes strong motives for inaction, should plead their want of knowledge as an excuse for not putting in force the powers that they possess.' Mr. Boodle, the agent for the Duke of Westminster and the Marquis of Northampton, and a solicitor of great experience, said of the Sanitary and Artisans' Dwellings Acts that 'they were almost as complicated as the Church Buildings Acts, which nobody has as yet understood!' Accordingly a consolidation of the sanitary laws of the metropolis is recommended. If such consolidation were to be undertaken, provision should be made for the general erection of mortuaries. In the event of a death from infectious disease, and in cases where the body lies in a room used by other persons, removal to the mortuary should take place at once. The Commissioners recognise, however, that there would be great difficulty in carrying out an absolute rule in such cases which would interfere with the habits and feelings of the people. The provisions of the Acts should be also amended with a view to securing in future dwellings in the metropolis greater height above the level of the street and larger areas in front of the windows of all cellar dwellings. It is recommended that the duty of discovering and reporting illegally inhabited cellars should be taken away from the district surveyors of the Metropolitan Board of Works, upon whom it has been improperly thrown, and should be placed in the hands of the inspectors of the local sanitary authority.

Building By-laws.—Upon the question of the amendments as to height of buildings and open spaces about buildings, which are desirable and practicable in the Metropolis Management Amendment Act of 1862, and the Metropolitan Building (Amendment) Act of 1878, the Commissioners recommend:—

(a) That upon the lines of the existing enactments in the Acts of 1862 and 1878 rules of more general application be framed to control the height of buildings in relation to the open space which should be required to be provided in front of the buildings, either in the form of land exclusively belonging to each building and kept free from erections or in the form of an adjoining street;

(b) That in the rear of every new dwelling-house or other building to be controlled by rules ordinarily applicable to dwelling-houses, and whether in old or in new streets, there be provided a proportionate extent of space exclusively belonging to the dwelling-house or building; that this space be free from erections from the ground level upwards; that it extend laterally throughout the entire width of the dwelling-house or building; that for the distance across the space from the building to the boundary of adjoining premises a minimum be prescribed; and that this minimum increase with the height of the dwelling-house or building.

Sanitary Inspection and Sanitary Staff.—All these improvements in Acts of Parliament without a sanitary staff to work them and see that they are carried

out, would be of no avail. Accordingly, the commissioners recommend that—

Advice should be given to metropolitan sanitary ties to increase in some cases their staff of inspect in all cases to select persons acquainted with the p of sanitation and of building construction. While impressed with the importance of this, they are pared to recommend so centralising a measure appointment of such inspectors by the Local Gov Board, but they are of opinion that the Local Gov Board might, pending future legislation with re London government, be provisionally intrusted wit on the appointments of inspectors.

Another important point is concerning the of medical officers, their residence within the daries of their districts, and the devotion c whole time to their official work. In some worst quarters of London the medical officers in a distant part of the town; and in very cases they are allowed to continue in private p Both these arrangements the Commissioners as mischievous; but, at the same time, lool the excellent work which in some parishes ha performed by medical officers of health wh had private practice, they do not recomme imposition of a positive restriction by law. recommend, however, that the residence of n officers in their districts, or within a mile boundaries, should be made compulsory, an the sanitary authorities should be advised to p as far as possible, that the medical officers devote their whole time to their official duties.

The Artisans' Dwellings Acts.—The quest to the borderland of action between the Metropol Board of Works and vestries and district boas stated to require immediate attention with rel to the carrying out of the various Artisans Labourers' Dwellings Acts. Places notorious remain so because each authority maintains th other ought to deal with them, the real cont being whether the improvement acknowledged necessary ought to be carried out at the exp the metropolis or of the immediate locality.

To prevent the continuance of this state of thin Commissioners suggest that in all those cases wh passed over by either the Metropolitan Board on t hand or the vestries and district Boards on the o the ground that the other authority ought to d them, the Government should appoint an arbit decide under which set of Acts the case should fal work may be in the opinion of the arbitrator of nature that the expense ought to be divided betw local authority and the Metropolitan Board, and should be given to him by law to recommend in su division of the burden, and to report accordingly Home Secretary, who should lay the report before ment.

In cases where a local authority neglects ceed with a scheme under Cross's Acts, they mend that in the case of the metropolis, the Se of State should be empowered, if after inqu satisfied that the local authority ought to c their powers in respect of the area to wh official representation relates, to make an requiring the local authority to discharge th in the matter, and that if such order is not c with, it should be enforceable by an order High Court of Justice.

With regard to Sect. 13 of Mr. Torrens' 1868, which empowers the central authority c tain representations by householders to direct

authority to proceed under the powers of Mr. Torrens' Acts, and provides that such direction shall be binding, the Commissioners recommend that this provision should extend to 'obstructive buildings' as well as to premises which are in a condition dangerous to health so as to be unfit for human habitation, and that any such direction by the Secretary of State in the metropolis shall be enforceable by the High Court.

They also recommend the repeal of Sect. 5 of the Artisans' and Labourers' Act Amendment Act of 1879 (42 & 43 Vict., cap. 64), which provides that an owner who has been required to execute works in order to put his premises into proper sanitary condition or to demolish premises may require the local authority to purchase such premises, as it puts a premium upon neglect of duty by the owner.

Local Government of the Metropolis.—The Commissioners remark that it is evident that the remedies which legislation has provided for sanitary evils have been imperfectly applied in the metropolis, and that this failure has been due to the negligence, in many cases, of the existing local authorities. 'It does not appear that more satisfactory action on their part can be secured without reform in the local administration of London.'

With the view of bringing specially under public attention the sanitary condition of the different districts in the metropolis, the Commissioners recommend that the Secretary of State should be empowered to appoint one or more competent persons for the purpose of inquiring as to the immediate sanitary requirements of each district, having regard to the several powers intrusted to the local authority, whether the Metropolitan Board of Works, or the vestry or district board; that the local authority should be empowered to nominate members of their own body to act with the officers so appointed, and that the reports of the result of such inquiries by the officers appointed should be transmitted to the local authorities, and should also be laid before Parliament.

This appears to us the most stupid and unworkable of all the Commissioners' proposals. The healthy public opinion which is to act as the motive power is not likely to be stimulated by a device of this sort.

Removal of Prisons.—A great deal of the overcrowding and other evils found in the housing of the working classes in the worst districts of London is owing to insufficiency of accommodation in those parts of the town where the demand for dwellings is greatest. Such districts are so densely built over that there is no probability of finding space, save by the removal of existing buildings. Now, as Mr. Torrens astutely pointed out some time ago, Her Majesty's prisons occupy no less than 45 acres in the metropolitan district, some of the establishments, Coldbath Fields, Pentonville, and Millbank, being in the most densely populated districts. The Commissioners suggest, therefore, that the sites now occupied by Millbank, Coldbath Fields, and Pentonville Prisons should be conveyed to the Metropolitan Board of Works, in trust for the benefit of those portions of the town which are most overcrowded.

In fixing the price at which the sites should be so conveyed, due regard should be had to the purposes for which they are so required. To carry into effect the object of securing additional land where most required in the metropolis for building room for workmen's dwellings and for open spaces connected therewith, power should be given, previous to their acquisition by the Metropolitan Board of Works, to sell or exchange, with the approval of

the Home Office, any portion of the sites referred to, that the areas obtained instead should be devoted in proportions, to be fixed by the confirming authority, to these uses and to no other.

Loans for Artisans' Dwellings from the Treasury.—There is a good deal of special pleading in this part of the report, and the probable loss to the Treasury of advancing money for artisans' dwellings at lower rates of interest is discussed at length.

The general principle the Commissioners lay down is that the State should lend at the lowest rate possible without loss to the national exchequer, and that in making the necessary calculations ancient losses should not be brought into account. In the case of public bodies, where the security of local public income in addition to that of land and buildings can be given, a scale lower than the present one might, they think, be established. Where, after investigation, the security appeared complete, this rate might be a reduction of $\frac{1}{2}$ on the $3\frac{1}{2}$ per cent. which at present forms the lowest charge, inasmuch as the rate of $3\frac{1}{2}$ per cent. apparently would cover expenses and leave a small margin. They are of opinion that the prolongation of the term of repayment and the readoption of the mode of repayment by way of annuity would still more facilitate borrowing, especially by the smaller corporations.

Municipal Provision of Workmen's Dwellings.

What is, perhaps, the most important recommendation of all is wrapped up in ambiguous language which diverts attention from its significance. It happens that the first Artisans' Dwellings Act ever passed—the Labouring Classes Lodging-houses Act of 1851—contained clauses which enable the Commissioners, by a skilful use of proposed amendments to that Act, to recommend the provision by the municipality of proper houses for the poor at the charge of the ratepayers. This is, we are convinced, the only way of dealing with the dwellings problem in the case of the abject poor. Lord Shaftesbury had, in 1851, the phenomenal gratification of personally conducting this Bill through both Houses of Parliament. It has been an absolute dead letter ever since; partly because its very existence was generally unsuspected, and partly because its elaborate procedure, needful in those early days of sanitary reform, is now unnecessarily cumbrous and troublesome. But in this Act are powers for local commissioners to borrow money on the mortgage of the rates for the erection, purchase, or lease of lodging-houses for the working classes, to be managed under local by-laws which may, among other things, fix the rent. The Royal Commissioners recommend that a trial should be given to this Act, if amended in certain respects to make it effective. They suggest that the Act should be made in London metropolitan instead of parochial.

As long as the government of London remains in its present form, the Metropolitan Board of Works should be the body invested with the execution of the Act. In the provinces the sanitary authorities, rural as well as urban, should be the authority for the purposes of the Act. Another reason given why the Act has remained a dead letter is that it has failed for want of more expeditious powers. The somewhat elaborate machinery devised for carrying it out was no doubt thought to be a safeguard against an unduly burdensome scheme being placed upon the ratepayers. The local authorities may, however, be considered competent to protect the interests of the ratepayers, and if any further precaution against an imprudent scheme be needed a local inquiry might be required before sanction was given to the borrowing of money for the purposes of the Act. The Commissioners further recommend that the local authority should be empowered to adopt the

Act by a majority of votes of the members present and voting, and that the consent of the ratepayers should not in any case be required for the adoption, and that the objections of ratepayers should not postpone the consideration of the question of adoption.

Messrs. Goschen, Lyulph Stanley, and Samuel Morley object to give local authorities these powers to provide houses, on the ground that 'the action of private builders and private companies will be proportionately discouraged.' 'Are builders likely,' they ask, 'to push the erection of large blocks of tenements if, in order to reduce their rents, the municipality take action largely under the Act of 1851?' The question is, no doubt, a very important one, admitting of large differences of opinion; but no private enterprise that we know of, except the malevolent enterprise of house-knackers, has attempted to grapple with the question of housing the very poor—those with no regular occupation, and living from hand to mouth. It is for these that municipal intervention becomes necessary.

Local Taxation.—So far the Commissioners have been on fairly safe ground, but they now plunge recklessly into social questions of grave importance on which the greatest variance of opinion is at present manifested. For example, in discussing Lord Shaftesbury's Labourers' Act of 1851, they say of it, and of nearly every proposal for improving the dwellings of the working classes as well as of other local improvements, that the present incidence of local taxation stands seriously in the way of all progress and reform. They think that until some reform is introduced which shall secure contribution to local expenditure from other sources of income, received by residents in the locality in addition to the present rateable property, no great progress can be made in local improvements. Considering the debate on the subject of May 5, and the narrow escape of the Government from defeat, this *pronunciamento* of the Commission will be a little embarrassing for the Cabinet. Attention is called in the report to the fact that land available for building in the neighbourhood of populous centres, although its capital value is very great, is probably producing a small yearly return until it is let for building. The owners are not rated in relation to the real value, but to the actual annual income. If the land were rated at 4 per cent. on its selling value, the owners would have a more direct incentive to part with it for building purposes, and the community would reap the advantages of diminished burdens on the rates and of a less sum for ground rent. It is recommended that all these matters should be dealt with when the law of rating comes before Parliament.

Valuation; Arbitration; Betterment.—To these important financial questions considerable attention is devoted. The report supports the principle that in a purchase by a local authority of land in an unhealthy area, for what are recognised by the Legislature to be great public purposes, they ought to be entitled to purchase upon terms that will secure the fair market value and no more to the owners of the property, and it is recommended that future legislation should prevent the excessive assessment of the damage done to trade profits. Appeals should only be allowed on an order, after leave obtained from a superior court, on grounds which shall satisfy the court that a failure of justice has taken place. **Opposition** to the confirmation of a provisional order should be confined to the single statutory ground

that the area is not an unhealthy area within the meaning of the Acts, and, in cases only where lands are proposed to be taken not included in the area in respect to which the official representation was made, that such lands are not required for the purpose of the scheme.

Other Recommendations of the Commission.—There are a great number of further—perhaps minor—recommendations to which all the Commissioners agree; and there are others which certain members of the Commission put forward on their own responsibility. Some of these we may find it necessary to enlarge upon at a subsequent date. At present we must be content with mentioning them. In the first category are recommendations that the Settled Land and other Acts be amended so as to apply trust funds to improvements in towns and the erection of artisans' dwellings, and that legal expenses be curtailed. The whole subject of the relations between the railway companies and the working classes, both with regard to the demolition of houses and to cheap or workmen's trains, is dealt with at great length. The Commissioners think that water companies should be deprived of their summary power of cutting off the water [this will be done by Lord Camperdown's Bill, *see* page 505], and that there should be a simple power by civil procedure to proceed for the recovery of damages against owners or holders of property by those who have suffered by their neglect in sanitary matters. It should be declared by statute to be the duty of the local authority to put in force such powers as they are by law intrusted with, so as to insure that no premises shall be allowed to exist in an insanitary state.

Recommendations of Individual Commissioners.—Ten of the fourteen Commissioners (Sir Charles Dilke, chairman, the Prince of Wales, Lord Salisbury, and Sir R. Cross not joining in the recommendation) give it as their opinion that legislation favourable to the acquisition on equitable terms of the freehold interest on the part of the leaseholder would conduce greatly to the improvement of the dwellings of the people of this country. Lord Salisbury adds a memorandum of his own, dealing especially with the overcrowding in the interior of London. He suggests that if the sites of the prisons mentioned in the report are sold at cost price to some authority or trust that will build workmen's dwellings upon them, or upon other similar sites obtained by exchange for portions of them, the result will be so far to satisfy the special wants under which, on account of its peculiar circumstances, the interior of London labours. He also takes exception to any proposal for enabling the holder of a long lease to force the freeholder to sell his freehold to him at an arbitration price. Mr. Goschen and the Hon. E. L. Stanley, while generally agreeing with the recommendations of the report for improving existing house accommodation, record their opinion that no real progress in this respect can be expected in London until reforms in the local government in London have created a strong central municipal authority of a genuinely representative character. They suggest that municipal action as to the providing of houses should, as a rule, be limited to cases where the municipality is itself making a sudden disturbance in the accommodation of the working classes by clearing large areas in the making of new streets or other similar improvements. Sir Richard Cross objects to the local authority taking upon itself the duty of providing for

using of the poor, save under exceptional instances. Mr. Dwyer Gray contributes a and, it must be confessed, very clever argument in favour of the advanced doctrine that 'the thorough remedy is to enable the local authority of town to acquire the fee simple of the entire district compulsorily.' Mr. Broadhurst makes suggestions, in which six other members for a land registry by local authorities. Mr. Collings is critical on a number of points, makes some sensible remarks about rural districts, a point not much noticed in the report proper; Mr. George Godwin draws attention to the efficient working of the co-operative system of the poor's dwellings known as the 'Famillistère de

cannot profess, even with this considerable amount of space, to have exhausted the points of the very suggestive report. It is a little rambling, and a little out of proportion in some respects; but it is honest and painstaking, going as far as it can, if not farther than, it could be expected to go, considering the diversity of opinions represented before the Commission, and offering a basis for sound and useful legislation. But let not our rulers, local or municipal, fall into the error of imagining that because the Royal Commission has reported, that they have no personal duty to perform in the matter. There is a temptation to regard the Commission's revelations as merely an interesting bit of historical reading. It needs to be urged again that the state of things which they reveal is just as bad, if not worse, at this present time as it was when the witnesses gave their evidence at Richmond Terrace. It is of no use to say that we get more laws, before attempting to use the law which we have already. 'Motive power' is the desideratum, and every citizen must bear his share in creating and supplying that motive power without which the most perfect machinery is of no use whatever.

JAMES B. PETTER, of Yeovil, the patentee of the 'Grate,' which has gained so much public favour since its introduction at the Smoke Abatement Exhibition, has issued a new catalogue, in which several new designs and improvements on the original will be found. Mr. Petter draws our attention to the fact that this time of year is the best for fixing the Nautilus Grate; a tiled hearth necessary adjunct, which may be utilised for the display of ferns and flowers during the summer months, dispense with the ordinary stove-grate ornaments.

VARNISHING TOMATOES.—Three Parisian manufacturers, in order to make tomatoes appear redder than nature, have been colouring them, have been varnishing them with a red compound and selling them as 'best quality.' These ingenious falsifiers have been condemned to pay a fine of one franc; not a very deterrent

Understand that Mr. Cecil Napier Hake and Mr. Wilson Hake, Ph.D., formerly of Queenwood, Hampshire, both of whom have had much chemical and analytical experience, have recently opened a Laboratory for the purpose of commercial and other analyses at Parson's Green, Fulham, S.W. Mr. Cecil Hake for several years been working in the Laboratory of the University of Paris. Messrs. Hake propose to start courses of instruction for Medical Officers of Health and for persons desirous of acquiring chemical knowledge in relation to sanitation.

THE METROPOLITAN WATER COMPANIES.

No one has ventured to accept our challenge of last month as to the generic impotence and idiocy of Parliamentary Returns. It is perhaps lucky that no one did so, for we have meanwhile fitted into our sling a stone much more hurtful to the hypothetical unbeliever than any that we had in our wallet at the time of writing. About fourteen months ago, Mr. Firth, searching about for figures wherewith to convict the Metropolitan Water Companies, prevailed upon his colleague in the representation of Chelsea to assent to a return giving a variety of particulars as to number of houses, and rentals, and rates of dividends, and allotments of new capital, and market values, and a good deal more, about each of these companies. After a year of incubation, the return has at length appeared; and we have no hesitation in describing it as one of the most stupidly compiled and misleading Parliamentary papers of recent times. (If the condemnation which this remark implies can only be gauged by the select few who make Government Returns their study, so much the better for the general comfort.)

It is apparently of no use to inveigh against the lamentable ignorance of statistical science which the great majority of Parliamentary Returns reveal on the part of their compilers. But if the Government do not see their way to the appointment of a competent statistician to edit and correct the crudities of returns ordered by Parliament, they might at least see that such returns are prepared by some one with an elementary knowledge of the subject on which he is writing. In the return with which we are at present concerned, conclusions are established with the sublimest disregard not only of the recent history of the water companies, but of the rule of three, and even of common sense.

We are no special admirers of the water companies, who have, we think, used the powers which Parliament in its unwisdom has given them in a harsh and grasping spirit. But from the point of view of strict law, they are no doubt entitled to do many of the things which the envious world outside has scolded them for doing. We are not now going into the equities of 'back dividends,' which the New River Company, for example, assessed at the insignificant sum of 15,000,000*l.* for their own undertaking, or into the quiet allotments of new stock at par, which one of the companies' advocates strenuously asserts to be the only legal mode of procedure. If the companies could be lured into the Palace of Truth, they would probably admit that in equity much of their procedure was indefensible; but as they had the advantage of a strong position, they would only yield to the enemy in proportion as they found their main fortress in danger. If the conscience of the average payer of water-rates is soothed by Mr. Dobbs' victory over the Grand Junction Waterworks, by all means, say the companies, let us keep up the illusion by some apparent (perhaps real) concession which, after all, will not much affect our income. And as soon as Lord Camperdown showed fight with his Select Committee, the companies were ready to express their willingness to adopt the essential principle of his Water-rate Regulation Bill. Short of out-and-out purchase of the undertakings, which must in any case be made sooner or later, this is the only way in which the water companies can be

brought to reason. Storm one position after another, and they will in the end be obliged to capitulate.

We cannot congratulate Mr. Firth upon the information which his return is likely to give him. For instance, there is a fallacy connected with the very first table, which the companies have not been slow to point out. A table is given, which shows in respect of each of the companies, the maximum number of houses or other buildings supplied with water in the years 1872 and 1883, and the total amount of the rates, rentals, and other charges for the supply of water to houses or other buildings during the financial years 1872 and 1883, as follows:—

Number of Houses and Water Rentals.

Name of Company.	Number of Houses or other Buildings supplied in		Increase per Cent.	Water Rentals from Houses or other Buildings in		Increase per Cent.
	1872.	1883.		1872.	1883.	
Chelsea	27,949	32,430	16.0	£ 70,963	£ 103,704	46.1
East London	104,637	141,738	35.5	152,655	238,939	56.5
Grand Junction	33,500	46,517	38.9	92,168	150,015	62.8
Kent	39,425	58,784	49.1	47,594	79,927	67.9
Lambeth	48,588	75,623	55.7	89,551	167,455	87.0
New River	120,662	140,353	16.3	274,386	412,090	50.2
Southwark and V.	79,075	100,854	27.5	103,215	179,528	73.9
West Middlesex	43,930	62,950	43.3	117,745	173,399	47.3
Totals	497,736	659,249	32.4	948,277	1,505,057	58.7

Thus, between 1872 and 1883, the number of houses or other buildings supplied with water by the companies rose from 497,736 to 659,249, an increase of 32.4 per cent., while the water rentals rose from 948,277*l.* to 1,505,057*l.*, or 58.7 per cent. The average rental appears thus to have increased from 1*l.* 18*s.* 1*d.* per house in 1872 to 2*l.* 5*s.* 8*d.* in 1883, or 19.9 per cent. But, as the companies very fairly remark, the houses newly erected are for the most part of a superior class, and those rebuilt are generally much larger than those which they replaced. In many cases, owing to works of public or private improvement, two or three houses have been converted into one; and thus, while the number of houses in the most densely populated parts of London has diminished, the value of property has increased commensurately with the increase in size.

In this explanation the compiler of the return detects special pleading, which he is at pains to rebut. Accordingly, he adds, from the Registrar-General's annual summaries, some statistics which show that in six of the eight companies the average number of gallons supplied daily to each house for domestic purposes was smaller in 1883 than in 1872. But has this ingenious gentleman ever heard of the Metropolis Water Act, 1871, and the regulations made under it for the prevention of waste? The diminution in the number of gallons supplied, on which he bases so subtle an argument, is probably fully accounted for by the stoppage of the waste, which formerly went on unchecked. Certainly it is a novel suggestion that the companies are now behind their practice in 1872 as regards the quantity of water they furnish. What has Sir Francis Bolton to say as to this discovery of his colleague?

The compiler of the return is on stronger ground in dealing with the companies' distributions of profits. The aggregate amount of dividends received by the shareholders during the period 1872-83 was 8,501,486*l.*, on a share capital which increased from

7,955,578*l.* in 1872 to 10,344,313*l.* in 1883. The rate per cent. of the dividend paid by each company was higher at the end than at the commencement of the period, notwithstanding that by far the greater part of the new capital created was issued to the shareholders or their nominees at par, an arrangement by which the dividend-bearing capital was, of course, increased to a greater extent than would have been necessary if it had been raised in the open market. The following table shows the rates per cent. of dividend paid by the several companies in the first half-year of 1872 and the last half-year of 1883, respectively, the amounts paid by the several companies by way of dividend, and the amounts of share and loan capital paid up during the period 1872-83 in respect of capital taken up at par by the shareholders and their nominees:—

Name of Company.	Rate per Cent. of Dividend in		Amount of Dividends.	Amount of capital paid up during the period 1872-83, allotted by shareholders at par.	
	First Half-year of 1872.	Last Half-year of 1883.		Share.	Loan.
Chelsea	6	7½	£618,080	£341,928	£53,400
East London	6	7½	1,256,218	—	150,000
Grand Junction ..	8	8½	793,621	213,600	36,700
Kent	6½	10½	602,170	174,712	—
Lambeth	6	7½	810,861	557,840	207,520
New River	7½	11½	2,356,719	366,040	225,112
Southwark and V.	5½	8½	852,804	251,893	41,075
West Middlesex ..	9½	10	1,211,013	295,535	—
			£8,501,486	£2,202,433	£715,117

The value of the premiums which would have had to be paid upon this 2,202,433*l.* share capital and 715,117*l.* loan capital, if it had been disposed of at the market price, is not given in the return, and indeed would be somewhat difficult of calculation; but it must have amounted to some hundreds of thousands of pounds.

It is where the return comes to deal with the market values of the undertakings, as assessed by the price at which their shares stood on the Stock Exchange list at the end of 1871 and of 1883, that it goes most hopelessly astray. In the preparation of this part of the return the Local Government Board invoked the assistance of the Share and Loan Department of the Stock Exchange, who appear to have furnished figures showing the nominal amount of each stock of the several undertakings existing at the date of the companies' reports for the second half-years of 1871 and 1883, and its estimated value at the market price on December 31, 1871, and December 31, 1883, respectively. But the compiler of the return sees nothing incongruous in placing the market values of the share and loan capitals at the end of 1871 in juxtaposition with the amounts of stock existing *half a year later*. An example of the way in which this is likely to mislead the reader is seen on page 10 of the return, where, under the heading of the East London Water Company, the nominal amount of the loan capital at the end of the first half of 1872 is given as 199,600*l.*, whilst the value of the loan capital at December 31, 1871, is given as 102,000*l.* only. It is not shown in the return upon what amount of stock the calculation as to market value was made, and the inference obviously is that the two figures given in the return bear some relation to one another—that the value, namely, of 199,600*l.* loan capital, was 102,000*l.* only.

increase in the amount of the East London capital is given on page 7 of the return as per cent., but the increase in its value as 371·8 per cent., or a net increase of 284·2 per cent. In words, we are invited to believe that 100*l.* of East London loan capital was worth two ree-quarter times as much in 1883 as in 1871! Under that the secretary of the Share and Department is wroth at this perversion of his . A similar criticism might be made (though discrepancy in these cases is not so large) as to an capitals of the Lambeth and New River companies and their apparent market value as in the return.

loan capitals of all the companies for the first 1872 and the second half of 1883—an interval years—are added up, and an increase in the amount is shown of 18·8 per cent. Side by side with these figures are the market values at the end of 1871, 1871, and December 31, 1883—an interval of twelve years, during which period there was an increase of 42·3 per cent. In the summary marked that 'the increase in the amount of loan capital has been comparatively small, but the increase in its value has been considerable,' the intention being to compare the two periods above given with one another. But they are different periods, and it so happens that, in the half-year immediately following that on the basis of which were based the calculations as

the return as published and the more accurate figures are not so serious; but the ratio of increase in the twelve years under consideration should more properly be 32·1 per cent. of capital and 101·8 per cent. of value, instead of 30·0 and 101·1 per cent.

The market values of the entire undertakings of the several companies at the end of 1871 and of 1883 appear from the Stock Exchange return to be as follows:—

	1871.	1883.
Chelsea	967,633	1,855,597
East London	2,072,991	3,693,735
Grand Junction	1,495,302	2,419,600
Kent	669,390	1,794,058
Lambeth	1,098,402	2,600,491
New River	4,881,229	9,880,012
Southwark and Vauxhall	1,555,784	2,860,934
West Middlesex	1,734,365	2,828,625
Total	14,475,096	27,933,052

Thus, assuming for the moment that the value of money was the same at both periods, it would have cost 13,457,956*l.* more to buy up the undertakings at the market price at the end of 1883 than at the end of 1871. In the interval, a total amount of 2,524,400*l.* more of share capital (nearly all allotted to the shareholders at par) and 516,813*l.* more of loan capital had been issued. Deducting these figures, as representing moneys spent in extensions and improvements, from the increase above shown, the sum of 10,416,743*l.* appears to show the net appreciation in value of the undertakings between 1871 and 1883,

Name of Company.	SHARE CAPITAL.					LOAN CAPITAL.				
	Amount in Sept. or Dec.,		Increase in Amount.	Estimated Value at end of		Increase in Value.	Amount in Sept. or Dec.,		Estimated Value at end of	
	1871.	1883.		1871.	1883.		1871.	1883.	1871.	1883.
.....	£	£	£	£	£	£	£	£	£	£
.....	658,692	1,000,600	341,908	797,633	1,672,475	874,842	170,000	150,100	170,000	183,122
.....	1,625,561	1,695,260	69,700	1,970,991	3,212,518	1,241,527	102,000	394,440	102,000	481,217
.....	786,400	1,070,000	283,600	1,284,629	2,128,300	843,668	210,700	265,000	210,700	291,300
.....	505,960	688,907	182,947	627,390	1,752,058	1,124,668	42,000	42,000	42,000	42,000
.....	723,632	1,358,000	634,368	867,452	2,463,616	1,596,164	230,950	125,000	230,950	136,875
.....	1,653,018	2,019,958	366,940	3,905,882	8,474,000	4,568,118	998,957	1,271,571	975,347	1,406,012
.....	1,050,900	1,390,000	339,100	1,172,515	2,350,509	1,177,994	378,691	432,000	383,269	510,425
.....	848,774	1,154,541	305,837	1,704,365	2,828,625	1,124,260	30,000	—	30,000	—
Totals	7,852,866	10,377,266	2,524,400	12,330,835	24,882,101	12,551,271	2,163,298	2,680,111	2,144,266	3,050,951

market values at the earlier period, a considerable amount of money was borrowed by at least two companies. The misconception likely to arise from this juxtaposition of figures that are not comparable has induced the secretary of the Share and Loan Department to publish in the 'Official Intelligence' of the Stock Exchange a corrected table, in which the nominal and their estimated values are compared at the end of the interval of twelve years. The principal of this table we reprint above. It will be seen that the true ratios of increase during the years from 1871 to 1883 were 23·9 per cent. in amount of loan capital, and 42·2 per cent. in value, or a net increase of 18·3 per cent. in value—a disproportion which represents more than the appreciation of value of the share capital of all sound and established joint-stock undertakings during that period. Thus the London and North Western Railway Four per cent. Debenture Stock was about 101 at the end of 1871, whereas at the end of 1883 it had risen to 101·8, the differences as to the share capital between

and the extra sum which the ratepayers would have had to pay at the end of 1883 for delaying the purchase of the undertakings for twelve years.

At present the project of purchase appears to be in abeyance. Meanwhile, London is in the shameful position of being dependent for its first necessity of existence upon the good-will of eight companies, with no co-ordination except in defence of their own 'interests.' Liverpool, Manchester, Birmingham, Edinburgh, Glasgow, and even Dublin have long ago taken the administration of their local water supply into their own hands. Is it not discreditable that the first city in the empire should lag behind? Sir William Harcourt, when asked to help Londoners in regulating their water supply and water-rates, has ostentatiously turned them over to the new Municipality which he has unsuccessfully attempted to create. But the mere creation of this new body will evidently be a work of time, and when at length it is duly constituted it will have many arrears to make up in other departments than that of the water supply. The taking over of the water undertakings on behalf of the

public is a foregone conclusion. Time must necessarily be consumed in the reorganisation of the water supply administration and rearrangement of the works, consequent upon the uniting of the undertakings; and it appears, therefore, to be very desirable that a temporary intermediate public authority should be established to acquire and hold the water-works in trust for the Central Municipality until it can make arrangements for taking over the duties. It is well to remember that (according to more than one high authority) every year's delay in the acquisition of the companies 'involves an enormous pecuniary loss and serious disadvantage to the rate-payers of the metropolis.'

THE SANITARY STATE OF WATERING-PLACES.

By a SANITARIAN.

THE sanitary state of watering-places and health-resorts is a matter of national importance. We go to the seaside in search of health and recreation, but do we always succeed? We get recreation, but do we get health? The elixir of life, for which the ancient philosophers sought so persistently, is now discovered to consist of an admixture of pure air and pure water. They are the very essence of life, and are far more valuable than the famous, and somewhat mythical, philosopher's stone. But these two essentials of human life are just what we do not, as a rule, get, especially at a seaside lodging-house. The proof of it is shown in the fact that while people return home with their faces tanned by exposure to the sun, and present all the outward appearance of being in robust health, they are often not really in so satisfactory a state as when they went to the watering-place for improvement. This is proved by the fact that in London and other large towns at no period of the year is illness more prevalent than at the close of the holiday season; and among no class is it more rife than among those who have just returned from an outing at the seaside.

Pure air and pure water are the two things most difficult to get at a seaside lodging-house. In the daytime, it is true, the windows are thrown open, and the pure air is freely admitted. But at night, when the doors and windows are closed, the house is pervaded by the faint odours of sewer-gas and other deleterious emanations from the kitchen, while the ventilation of the bedrooms is stopped, as far as possible, by the chimneys being stuffed with bags of straw.

As to the water, the chances are that there is but one cistern, and the water is used for domestic purposes as well as flushing the water-closets. But even when there is a separate cistern, it is seldom that this is cleaned out. The water supplied to the town may be perfectly pure when it is delivered into the house; but it deteriorates if it is allowed to remain long in the cistern, however carefully a tank or a cistern may be closed; if it is situated out of doors, sundry vegetable and animal matters are sure to find their way in, and the result is decay and putrefaction. Leaves of trees, live and dead insects, excreta of birds, soot from chimneys, and other various substances of organic origin, are almost invariably found in these receptacles. If the cistern is not frequently cleansed, the obnoxious deposit soon taints the water and renders it unwholesome.

If complaint is made, if the lodger is not shut up entirely by some rude remark, all the redress he gets is, 'Well, perhaps the drains do smell a little at times, but it's only in the morning, and it goes off as soon as the windows are opened.' But this does not recompense the lodgers, who have been all night inhaling this subtle poison. So the good which the sea air and the breezes of the day have done is lost, and a little poison is taken into the system, which, when the lodger returns home, it is the doctor's business to eradicate.

Lodging-house keepers are, to a great extent, in fault, but the authorities of the town, whose business it is to look after the sanitary condition of the locality, are infinitely more to blame. In a very large number of watering-places where there is a system of main drainage, there are a number, if not a majority, of the houses which are not connected, and where if investigation took place it would be found that the only means of drainage is a cesspool in immediate contiguity with the house.

There are, too, towns where there is no system of main drainage, and where cesspools in consequence abound. Diphtheria, typhoid, and bad, especially cesspool, drainage, are almost synonymous terms, and the sooner the public are imbued with this idea the better. Numbers of cases could be adduced, some of which were legally investigated and the facts proved, where fatal cases of diphtheria, typhoid, and other zymotic diseases arising from drain poisoning have occurred solely from this cause. In one case there were two cesspools each in a state of overflow, communicating with the water-closet, and these again communicated with the water-cistern, from whence the domestic water supply was obtained, and thus the water was made the agent for ventilating the cesspools, through which the gas was seen to bubble up and escape.

At the time these cases created a scare, and it was hoped that the authorities of the towns would bestir themselves, and that in one case they would institute a system of main drainage, and in the other insist on all the houses in the district being connected with the sewer. But time has passed and nothing has been done, and, as far as I can see, nothing will arouse them but a serious epidemic, one sufficiently pronounced to kill a number of the inhabitants, and to frighten away all the visitors.

To these and other errors of omission and commission are to be attributed the sickness which follows the return from the holiday trip, the heavy doctors' bills we have to pay at Christmas, and at least some of the many gaps in the family circle too often painfully recalled to our mind by this festive season.

Much has been said, but more remains behind.

Most persons when they go to the seaside indulge in a sea-bath, therefore the purity of the water in which they bathe is another very important matter. The increasing pollution of tidal rivers, and the sea, by the discharge into them of sewage and other noxious matter, is a subject of deep importance. The evil is one which has largely increased of late, and will continue to increase as seaside towns are better drained, and the houses connected with the sewer become more numerous. The nuisance will continue to increase in direct proportion to these improvements, and as the drainage of seaside towns is at present but partially carried out, the evils arising from the discharge of crude sewage into the sea, already sensibly felt, will be increased fourfold.

Some years since the idea was current, and is not entirely dispelled, that all that was necessary was to discharge the sewage into the sea, and there was an end of it; but such a consummation, though devoutly to be wished, has proved fallacious. For any reasons the sea refuses to have anything to do with the more solid portions of the sewage, and casts it up upon the shore. Another evil is that when sewage, or water highly charged with organic matter, mixes with sea-water, sulphuretted hydrogen is evolved, which accounts for the stench arising from harbours and foreshores wherever the sewage of a town discharges itself into the sea. The sea is not only highly disagreeable, but it is also highly poisonous, and consequently detrimental to health.

There are other evils and nuisances connected with this practice which sooner or later will make themselves apparent in an exceedingly unpleasant manner. When people talk about throwing the sewage of a town into the sea, they have very little idea of the amount of solid and liquid matter they have to deal with. To convey some idea of this let us take the sewage of a town, say in the height of the season, of 50,000 inhabitants; such a population exclusively using water-closets, and with all the houses connected, would produce, on an average, 1,250,000 gallons of sewage daily, more rather than less. A gallon of sewage weighs 10 lbs.; 1,250,000 gallons, therefore, will be equal to 12,500,000 lbs., or 558 tons of contaminated water, which is poured into the sea daily; and we are asked to believe that this can be done without causing a nuisance or being detrimental to health. To illustrate this evil a little further, let me say that in a mixed population of both sexes and all ages, it has been found by experiment that the excreta of each person per day is equal to 2½ lbs., that of a population of 50,000 persons would consequently be 125,000 lbs., or 55 tons daily, every pound of which is highly putrescible, prejudicial to health (and which may, and more often than not does contain, the germs of disease), mingling with the water on the foreshore, and which we are asked to bathe. This 55 tons of excrementitious matter may be divided into two parts, the solid and the liquid. The solid is to the liquid as 1 to 16, rather more than less. Thus the solid portion would amount to 7,810 lbs., and the liquid 117,190 lbs. Human fæces, however, have been found by experiment to contribute only one-fifth of the solid putrescible matter which is contained in sewage. This being the case, it appears that a population of 50,000 would produce a mass of over 17 tons of solid manurial matter daily.

Seaside authorities would have us believe that all this is held in suspension and is carried away by the tide; but such is not the case. First, then, as to the matter being held in suspension. Modern scientific research teaches us that matter which would remain suspended for many days in fresh water is immediately precipitated when the water is saline. In the case of sewage discharged into salt water, cohesive traction comes into play at once, and the minute particles of suspended clay adhering to the organic waste particles are carried to the bottom of the sea, or the river, where they form pestiferous banks of ooze, emitting offensive gases, which at health resorts foul the water of the bathing ground, and then communicate disease to the bathers. Anyone who will take the trouble to ascertain the saline constituents of salt water will see at once that must

be so, as it contains many of the salts used by chemists for the purpose of precipitation.

Secondly, as to the action of the tide, it is an entire misconception to imagine that the tide proper has any effect on floating bodies, or matter suspended in the water. A tide is a vertical rise, or upheaving of the sea, which as it travels along the coast causes the phenomena of high and low water. This tidal wave or impulse travels at the rate of from twenty to a thousand miles an hour. In the English Channel it travels at the rate of about sixty miles an hour. The water under this impulse, has no horizontal movement, it being of form and not of substance, and it travels in one direction only, as may be seen on reference to the Admiralty Tide Tables. It enters the channel at the Land's End and proceeds through the straits of Dover, and meets the North Sea tide at the mouth of the Thames; but this movement, unlike that of the tidal current, never changes its direction. The motion of the tidal current is horizontal, and by it floating objects are impelled backwards and forwards, in the direction in which the current runs. It is this misconception as to the action of the tide, this confusion of ideas as to the progress of the tidal wave, which passes never to return, and the tidal current or horizontal movement, which is imparted by it to the water, which has led so many people into error. The water forming the tidal wave being raised, by the attractive power of the moon, above its ordinary level, is impelled by its natural gravity to return to its usual level; that is to say, the particles of water successively finding themselves under the progressive force of the wave, start along in the same direction with it, and endeavour, but in vain, to keep pace with it. Gradually they lose the influence which has dragged them along; the force of gravity predominates, and they retrace their steps backwards, descending the inclined plain they had previously ascended, till they reach their original position, again to come under the influence of the succeeding tidal wave. It seems, therefore, that the movement of the water under the tidal influence is one of constant oscillation, so that objects floating on its surface, or held in suspension, are carried a certain distance and then brought back again. The difference between the velocity of the currents and the motion of the tidal wave is so marked that it shows unmistakably how entirely distinct they are. Supposing the tidal impulse acted on the water horizontally instead of vertically, and carried it along at the same rate, navigation would be, except in one direction, an impossibility.

From what has been stated it must be evident that the discharged sewage, instead of being carried away never more to be heard of, as some have fondly hoped would be the case, becomes subject to the oscillatory movement of the tidal currents, and the solid portions, after a certain period, are gradually deposited in the bights of rivers, and quiet nooks and bays of the shore, somewhat removed from the more active influence of the current. From this gradual deposition and the chemical action of the salt water on the sewage results the offensive smells which at low water pervade the shore and harbours of ports, and the watering-places where sewage is discharged into the sea.

There is yet another and more deadly evil arising from this practice. A sea-outfall must for a certain time during each day be tide-locked. It is an evil for which there is no remedy, and the further the

outfall is carried into the sea the worse the evil becomes. The meaning of tide-locked will be better understood if it is explained that, as the tide rises, it enters the culvert and forces back the sewage, which in consequence becomes stagnant. During this time the sea-water mingles with the sewage, decomposition and precipitation set in, and gases of a highly deleterious character are generated. As the tide rises these are also forced back, and, having no other vent, find their way up the various drains and subsidiary sewers into the houses. It follows, therefore, that if sewage discharged into the sea was carried away by the tidal currents, the evils arising from a sea-outfall would only be mitigated and not overcome. I have studiously avoided mentioning towns where these evils exist. Were it not that I have no desire to injure certain health-resorts, it would be easy to point out examples of the entire failure of sea-outfall to improve the sanitary state of a town. The only real remedy is to cease to discharge the sewage into the sea, and either put it on to the land, or treat it by some of the many processes in vogue for precipitation. It may be urged that this will cost money; but the annual expenditure in either case would be small in comparison to the good that would accrue.

The perfect sanitation of a watering-place may be beset with many difficulties; but they are by no means insuperable. Authorities anxious to attain this most desirable end must understand that sewage is a nuisance which cannot be got rid of without cost. But the expenditure of money will not in all cases suffice. Care and constant supervision is also necessary. To start fair, a proper system of main drainage must be adopted, the sewers and drains should be well laid, and must be self-cleansing. Sewers of deposit mean the decomposition of putrid matter and the formation of sewer-gas; this gas being constantly formed, it as constantly escapes through the gratings and ventilators into the streets, or through imperfectly-trapped sinks and openings into the houses. Again, during a storm complaints are made that the drains smell. The cause is easy to find; the storm-water, unless there is a storm-outfall, accumulates in the low-level sewers, and the sewage heads up. As the sewage rises, the gas becomes more and more concentrated, and if it cannot find vent in any other way it is forced up the private drains, and is discharged into the dwelling-houses through the traps. The only remedy for this is to see the outfall is not tide-locked, and that the sewers are self-cleansing.

The contamination of the subsoil from false levels, leaky pipes, and defective main sewers is another evil to be especially guarded against. If the saturation of the soil is allowed to continue, sooner or later some deplorable catastrophe must follow.

House sanitation is a large subject, and one that has been very much neglected, but till this has been thoroughly attended to, no town or community of people can expect to be truly healthy. House drains, even of modern construction, are often very faulty, but the older ones are simply abominable. Many of them are in a very dilapidated state, and more often than not with insufficient falls; some are square-shaped, and far too large. It is impossible that such drains should be self-cleansing, so that they are constantly silting up, and eventually become choked with a large quantity of foul-smelling deposit. In these and other foul drains large volumes of sewer-gas are generated, and furnish a constant supply both

to the houses to which they are attached and the sewer with which they are connected.

Water-closets are, as a rule, defective; the old pan-closet is especially objectionable. There are plenty of good patent closets, which may be obtained at a reasonable cost, but it is not my business to advertise them.

Finally, a model health-resort should have a system of sewers extending to all the outlying portions of the town, so that the whole of the inhabited parts of the district may be effectively drained. The suburbs of a watering-place are, as a rule, inhabited by the poorer class, and are often not drained at all. These are the places where infectious diseases are bred, and from whence they are disseminated by means of germs contained in the atmosphere. The distance to which, under ordinary circumstances, these deleterious emanations are carried, is from six hundred to a thousand feet in a horizontal direction; but when strong winds are in operation, the distance to which these poisonous germs may be transported is unknown.

For the majority of watering-places to remain in their present unsanitary state is the height of folly. The first and most important thing is that a health-resort should be healthy. Medical men and physicians in London know more about the sanitary state of watering-places than do most of the inhabitants themselves, and it is not to be expected that they will send their patients to a place which is only partially drained or honeycombed with cess-pools, as are too many of our seaside towns.

Lodging-house keepers will perhaps say that they find it hard to pay rent and taxes, and make both ends meet, and they may ask how are they to live if the rates are increased by the outlay of large sums of money for drainage purposes; but these good people should remember that the health and comfort of the visitors means the prosperity of a watering-place.

THE rebellion in British America is calling out all the troops stationed in Canada. It was found that the medical organisation is nearly useless, and it has been entirely reorganised. The long marches and bad weather will probably incapacitate many soldiers.

DAMAGES FOR DEFECTIVE DRAINS.—A case of considerable sanitary importance (*Chichester v. Lance*) has been recently tried before Mr. Justice Wills and a special jury. The action was to recover damages from the defendant, who was said to have permitted the drains of the house he let to the plaintiff, to remain in a dangerously defective condition. The case does not seem to have been a bad one as against the landlord, who had not been in possession of the house a long time, and he did not decline to recognise his responsibility. But the repairs, when undertaken, were alleged to have been imperfectly executed, and an illness ('typhoid') resulted, an illness which the medical evidence went to show, and the jury found, was directly attributable to the insanitary condition of the drains. The damages were assessed at 45s. Owners of house property, and owners especially of unhealthy houses, would do well to take note of this decision, which is not likely to be forgotten by persons who may have the misfortune to find themselves in occupation of defectively drained houses, and to be sufferers in consequence. The decision cannot fail to have good results, and we hope, with Dr. Dudfield, of Kensington, that it will hasten the time when it will be recognised as a principle of English law that there is an implied warranty when a house is let that it is in a proper sanitary condition, and fit for human habitation.

TRAPS FOR YARD AND AREA DRAINS.

By FRANCIS VACHER.

Medical Officer of Health, Birkenhead.

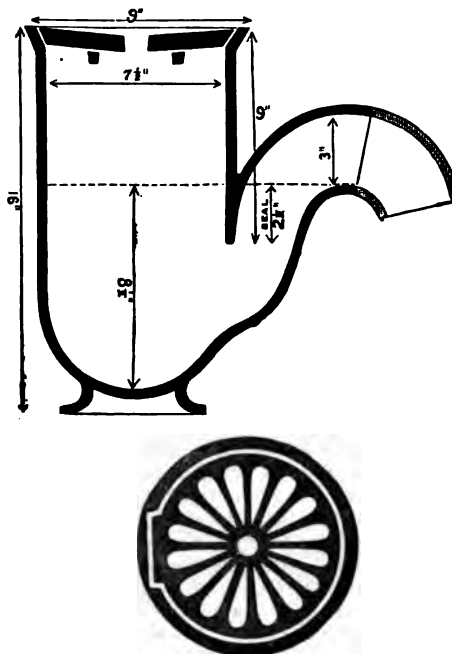
ordinary sanitary appliances few are more utterly imperfect than the traps provided for yards and areas of town houses. Yet this is from want of attention to the subject, no dearth of variety. Various devices, displaying more or less original knowledge, have been invented and improved, and re-invented; so that the number of traps granted for these drains in recent years may be counted by the score.

Among yard and area drains, though at present universally required, has but lately been recognised as a matter of first importance, and even now none to time one sees inlets to such drains closed by a grating only. Some of the oldest traps have been seen in such situations are so-called dish traps, which, if thoroughly well made with cement and a sufficiently deep seal, may be efficient. As usually found they are useless. Son's trap, which under any circumstances takes some time to make, is now less in favour than the D trap, made of iron or earthenware, with a seal from a quarter to three-eighths of an inch. It is so readily that it is commonly placed in a yard, without any setting, to permit of its being lifted and emptied. It is probably the cheapest trap, which may account for its popularity. I have no other recommendation. Bell traps, so easily fitted to sink-pipes, are only rarely met with in yards. However, in the areas and yards of tenement houses one sees the dish trap which is a bell trap inverted, fouling as easily and with no deeper seal. Valve traps are as a rule less satisfactory than other traps, and perhaps owing to more than their defects, they are little in use in yards and area drains. They soon get out of order and need no care and attention will prevent it. The trap, which one may yet occasionally see in yards, would really be a very efficient trap, but that it is difficult to cleanse and readily passes solids into the sewer. The small gully trap, which one may see as an S trap with a catch-pit, is or may be a very efficient trap, and is, I am pleased to say, coming more and more into use. I have at no time recommended these traps, but finding a lack of those provided had fixed gratings or shallow seals, or were flawed castings, I thought it necessary in all instances when requiring a trap to specify that it should be approved. I have solved the settling of a minimum standard of requirements.

I need not to me reasonable to ask that the depth of the gully-box inside should be not less than 12 inches and the diameter not less than 7 inches; that the trap should retain not less than 8 inches of water and that the seal should in no case be less than 2 inches. For many reasons I consider an earthenware trap as much better than an earthenware one. The trap must, of course, be perfect, and the seal must be rubbed down quite smooth. The trap is to iron traps, that they rust, is got over by coating them in zinc, commonly called galvanising. The trap should be hinged to the trap, or it may be opened, and its diameter should be fully a foot or of an inch less than the collar, so as to allow of being easily opened. The box of the trap may

be square or round, but I prefer the latter. The whirl of the water in a round box tends to wash the sides, and a round box with a round bottom is certainly more easily emptied and cleansed than a square one. A semicircular iron tool, made to size, should be provided to scrape the inside of the box, and lift the solid contents.

The illustration represents a gully-trap of the size and shape which appears to me well suited for yard and area drains. The principal dimensions are given in the cut. It retains 8½ inches of water, 2½ of which is seal.



It is made either with a short or long discharge pipe, for areas where the drain is near the surface *short*, for yards where the drain is usually several feet deep *long*. The short is cut off at an angle of 80° with the horizon, the long at an angle of about 15°.

I need hardly add that I lay no claim to having invented anything about this trap. I have no interest in its being sold, and anyone is quite at liberty to make it. However, it is a simple fact that a short time since I did not know where to buy a yard trap with a deep enough seal, and in other respects satisfactory. The price of the trap here figured is 7s., with either long or short discharge pipe. An additional charge is made for galvanising.

In most situations the 2½ in. seal will be found sufficient. When, however, the trap does not receive from a sink-pipe, bath waste, &c., and when it is in a yard, which is not regularly sluiced down, a deeper seal may be desirable. But in such a situation no water-trap affords any security. Where the loss by evaporation is not frequently replaced, a 4 in. seal is only better than a 2½ in. inasmuch as it will not fail quite so soon.

It is hardly necessary for me to insist on the necessity of all traps being set level, as a slight slant forwards will convert a deep seal into a shallow one.

The trap may be obtained of Messrs. Hinson & Co., Limited, Birkenhead.

A COMMON CASE.

THE possession of a house in Regent's Park was secured with the full confidence that the systems of drainage and water supply were in perfect order, because the house was in excellent general and decorative repair, and the late occupant was a member of a representative firm of builders.

The main drain was found to be an old brick sewer, one foot in diameter, the gradient nearly flat throughout, improperly laid, and the flow very defective. This was at once separated from the common sewer, and then removed. A drain of six-inch glazed stoneware socket-pipes was laid from the front of the house to the back area upon a bed of Portland cement concrete. The course of this drain was intercepted by three man-holes and inlet ventilators. Two of the closets were found supplied with D traps, which were removed; and lead syphon traps substituted, each being ventilated at the crown by means of 1½-inch pipe. The closet in the basement was separated from the drain, and connected by means of glazed stoneware pipes with the man-hole. The safes under the closets were untrapped and communicated directly with the drain. This connection was cut, and the discharge was directed into the open air. Two of the soil-pipes were within the house, and were used as rain-water pipes—one of them opening beneath the eaves, and close to a bedroom window. New rain-water pipes were supplied, and the soil-pipes were prolonged nearly vertically and with undiminished diameter above the roof, and away from any window or chimney of this or the adjoining house. The cisterns were five in number, and all these (with one exception) were directly connected with the drains or soil-pipes: the exception supplied the scullery sink and boiler. All were furnished with overflows discharging into the open air; and each cistern that supplied a closet, which had been hitherto available for common domestic requirements, was rendered incapable of being used for any other purpose than that of flushing. The rain-water pipes, excepting those that had served also as soil-pipes, led into an underground cistern which communicated with the main drain through the medium of a waste-water pipe. This cistern and the pump above it in the scullery were removed, and all the rain water was conveyed to the gratings of syphon gullies, and then made to pass through four-inch stoneware pipes into a man-hole. Originally the waste water from the bath, as well as that from the safe, flowed directly into the soil-pipe; so that sewer-gas was effectually laid on, and freely introduced by means of two orifices into the very heart of this dwelling. The waste from both sources was diverted through one of the rain-water pipes into the open air. All the sinks were in immediate communication with the drains or soil-pipes; they were cut off, and made to discharge into the open air or a rain-water pipe. The bell-traps were also all replaced by stoneware syphon gullies.

ALL rags sent to New York are disinfected in the following manner:—The rags are arranged in bundles and placed in an impermeable receptacle into which superheated steam is introduced (330° F.). In about five minutes the temperature of the bundles is so high that in two hours it does not fall below 100°. The experiments that have been made prove that this process destroys completely all germs contained in the rags, whereas sulphurous acid is not so successful.

DRAIN-TESTING WITH 'SANITAS' OR 'TEREBENE' OIL.

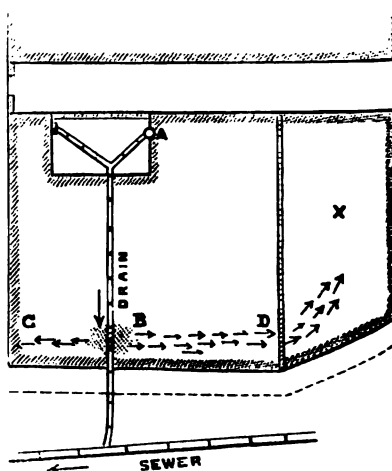
By CHARLES MACMAHON.

Sanitary Inspector, Torquay.

DURING the last five years I have used 'sanitas' and 'terebene' oils for the purpose of testing drains and soil-pipes with considerable success. My method of applying the test is as follows. Into the uppermost water-closet, or head of the system of drainage of the house to be examined, pour about 4 ozs. of 'sanitas' oil, or about double the quantity of 'terebene,' after which throw down a pailful of very hot water; shut the seat lid and the door of the compartment; then leave the house for about ten minutes, in order that the fumes may be blown from the clothing, and that the power of smelling may be keener; re-enter, and smell carefully along the whole line of the house drainage, particularly at the various sinks, scullery, pantry, housemaid's trough, lavatory, bath, waste-pipe of water-closet supply cistern, &c., and if the slightest odour of the testing oil is found, mark where it is *first* perceived. I consider it advisable to go out again, and return in a few minutes to verify any results obtained. Of course the place where the test was applied must *not* be re-entered, and the window should be closed before testing; in fact, the water-closet or other place should be as air-tight as possible. Wherever the odour first escapes there is undoubtedly a defect close by, and a search should be made at that spot for it.

The advantages of this mode of testing are:

1. That no apparatus of any kind is required; a small bottle of the oil suffices.
2. That no assistant is required.
3. That if carefully applied, not only is the fact of a defect existing made known, but the very point where it lies is invariably indicated.

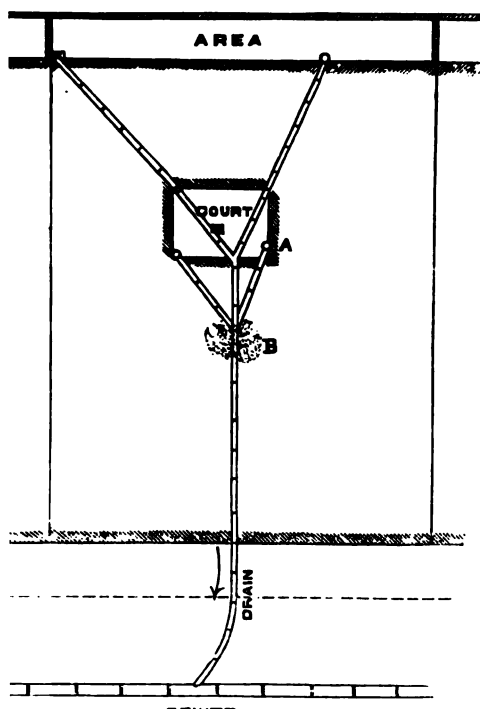


Case No. 1.

- A. The soil pipe of the w.c., into which the test oil was poured.
- B. The spot under the floor where about two feet of saturated earth and the broken collar of a pipe was discovered.
- C. D. Places where also the odour of the testing oil was perceptible.
- X. The house in which the cases of illness and the deaths occurred.

Of course, a keen sense of smell is absolutely essential to the operator. If no result is obtained within twelve hours after the application, the drains, &c., may be pronounced sound. I beg to narrate an

nce of successful drain-testing, which is men-
d in my recent 'Report upon Seven Years'
ary Progress in Torquay.'* In August 1879
was some illness and complaint of bad smells
house on Victoria Parade. I tested the drains
e house carefully, and made an examination of
anitary arrangements, but neither succeeded in
vering any cause for the bad odours, which the
pier was convinced proceeded from drains. I
ned the adjoining occupier's consent to test his
is, which, however, he maintained was unneces-
as he was sure they were right, having been
tly laid. The test was applied, with the result



Case No. 2.

pipe into the w.c., at the head of which the test was applied.
spot where the smell of the testing oil was first found, and
ere under the floor and three feet of earth besides was dis-
covered a pool of sewage, caused by a defective junction of the
es.

he odour escaped near the door of the second

It was unmistakable in the first, and in a
ard of No. 2 shop, in a direct line with the
places, it was also found. The drain was
under the spot where the smell first escaped,
about two inches of the collar of a pipe was
n off, from which, through earth and party
sewer gas found its baleful way to the house.
unfortunate occupier had suffered illness in
mily, and some deaths also occurred, which
to some extent, doubtless, due to the cause
brought to light. I forward two sketches.
illustrates the case just related; perhaps No. 2
efficiently explain itself.

ERY JUPE, a dairyman, has been fined £5 and costs
Newport magistrates for supplying adulterated milk
Isle of Wight Union Workhouse.

* Reviewed in the SANITARY RECORD of March 15.

THE SANITARY RECORD.

MAY 15, 1885.

*The Editor will be glad to receive, with a view to
publication, announcements of meetings, reports of
proceedings, and abstracts or originals of papers
read before the members of any sanitary or kindred
association.*

Local Authorities throughout the country
would confer a favour on the EDITOR of the
SANITARY RECORD by forwarding to him all
documents relative to Water-supply, Sanitation,
and Health matters generally, which come under
their notice. He would also be glad to receive
reports from Engineers of Waterworks, Sewerage
Projects, and Domestic Drainage Improvements
for notice, comment, and illustration.

DISQUALIFICATION BY MEDICAL RELIEF.

OUR readers are accustomed by this time to see
sanitary considerations insinuating themselves into
almost every department of social life and organisa-
tion; but they might have been forgiven if they had
passed by the Irish Registration Bill on the other side,
as a thing in which they had as sanitarians no sort of
interest. Lurking, however, in Clause 3 of that Bill
is a medico-sanitary point of the utmost importance.
The clause provides that 'medical or surgical assist-
ance, or the giving of medicine under any Act relating
to medical charities in Ireland, shall not be deemed
to constitute relief under the Acts for the more effec-
tual relief of the destitute poor in Ireland, within the
meaning of the Representation of the People Acts.' In
other words, no one in Ireland will be deprived of
the franchise, because he accepts medical assist-
ance free of cost to himself. It is noteworthy that a
clause similar in its object to this was proposed last
June in Committee of the Franchise Bill itself by
Mr. Commins, and was then rejected by Sir Charles
Dilke as being too wide in its scope, and as taking
away inducements to people to join friendly and
provident societies. But when the Irish Registra-
tion Bill came up for discussion on the 24th ult.,
the Government were found to be supporting the
clause removing electoral disqualification by the
receipt of medical relief in Ireland. It was argued
by Irish members that the circumstances of
England and Ireland are, in the matter of medical
relief, wholly different; and in the end the clause
was adopted by 76 votes to 20. It was felt, how-
ever, by certain English members that what was
right for Ireland could not be wrong for England;
and, accordingly, in Committee of the English
Registration Bill on the 7th instant, Mr. Davey
attempted to get a similar clause approved by the
House. It was opposed by the Attorney-General

mainly on technical grounds, and was in the end rejected by 170 votes to 102.

But, nothing daunted, Mr. Davey raised the question again on the Report of the Bill on the 12th inst., and was then successful in getting, by a majority of 37 votes, the receipt of medical or surgical relief, and the giving of medicine in England exempted from the definition of parochial relief within the meaning of the Representation of the People Acts.

It may not be amiss that the question of disqualification by medical relief having been thus raised, we should look into the present position of the law in the matter, and endeavour to ascertain what amendments are needed to secure his equitable rights to the artisan elector, compelled by circumstances over which he may have no control (as for example the outbreak of infectious disease in his house), to bring himself into relations with medical or hospital relief agencies that may invalidate his voting capacity. Now it is an ancient canon of our law that no pauper is entitled to vote at elections, and this canon has been crystallised in the 14th section of the Divided Parishes and Poor Law Amendment Act of 1876 (39 & 40 Vict., c. 61) as follows; 'No person shall be entitled to vote . . . in the election to an office under the provisions of any statute who shall be in receipt of relief given to himself or his wife or child, or who shall have been in receipt of such relief on any day during the year last preceding such election.'

It was decided in 1878, by the Revising Barrister of the Tower Hamlets, that the claim of a man to vote at a Parliamentary election must be disallowed on the ground that he had received relief by his children having been treated for small-pox in the Homerton Hospital, though they had been removed thither against their father's wish.* The obvious importance of encouraging the use of these hospitals as much as possible by the independent poor, and the difficulties which would be thrown in the way of their free employment by such a decision as the above, induced Sir Charles Dilke—then a private member—Mr. Rathbone, and others, to introduce, in the autumn session of 1878, a Bill 'to remove disqualification by medical relief for infectious or contagious disease.' That measure proposed that no person should be deemed to be disqualified to be registered as a voter, or to vote at any election of a member or members to serve in Parliament for any county or borough, by reason only that he or any member of his family, or any person whom he is liable to maintain, had received medical treatment or relief for any infectious or contagious disease as an in-patient or out-patient of any hospital, infirmary, or dispensary established or maintained by any sanitary authority, or poor-law authority, or at which he had been so treated or relieved by the order or with the sanction of any such authority, or the medical officer thereof. This Bill got successfully through its various stages in the House of Commons; but the amendments proposed in the House of Lords by the Lord President of the Council so far emasculated it that its promoters thought it best to abandon it. Since then the question has more or less slept until the recent debates have brought it again into prominence.

The elections more particularly contemplated by the Act which prohibits paupers from voting, are parliamentary, municipal, local board, and poor-law

guardian elections. Except in the case of the former, the qualification for a voter is practically the same. The voter must be a ratepayer rated to the relief of the poor in the district or part of a district for which he claims to vote, for the space of one whole year immediately preceding the day of tendering his vote. But whilst as regards the metropolis, and local government and rural sanitary districts, there is an enactment defining the 'relief' which disqualifies, as regards boroughs *quod* municipal elections, recent legislation has put this matter upon a proper footing.

Sect. 9 of the Municipal Corporations Act of 1882 (45 & 46 Vict. c. 50), provides that 'A person cannot be enrolled as a burgess if he is (a) an alien; (b) has within the previous twelve months received union or parochial relief or other alms, or (c) is disentitled under any Act of Parliament.' Sect. 33, subsection A, of the same Act goes on to provide that 'A person shall not be disentitled to be enrolled as a burgess by reason only (a) that he has received medical or surgical assistance from the trustees of the municipal charities, or has been removed by order of a justice to a hospital or place for the reception of the sick at the cost of any local authority, or (b) that his child has been admitted to and taught in any public or endowed school.'

The word 'union' in Sect. 9 is new, and was introduced, at the instance of the Local Government Board, to avoid any difficulty that might arise from the relief given having been a charge on the common fund of the union, under the Union Chargeability Act (28 & 29 Vict., c. 79). The whole of Sect. 33 is also new. The only persons who can be removed by the order of a justice to a hospital at the expense of the local authority are those who are suffering from a dangerous infectious disorder, and who are without proper lodging or accommodation, or are lodged in a room occupied by more than one family, or on board any ship, or in a common lodging-house (Sect. 124 of the Public Health Act).

The term 'without proper lodging or accommodation' is an elastic one, and admits of many definitions. Some justices have granted orders of removal on grounds which had reference not so much to the welfare of the patient, as to the fact that the patient was so placed as to be a probable source of infection to others. In cases of this kind it would be obviously unjust to deprive a citizen of his civil rights because he happened to be suffering from an infectious disease and because a justice thought that, in the interests of his family, he should be removed to hospital; whilst in the case of a patient who voluntarily isolated himself for the benefit of others, the deprivation of these rights would be a greater hardship. It is open to grave doubt whether this could be legally effected, since it has been held that an inhabitant, in the ordinary sense of the word inhabitant, does not cease to be within the purview of Sect. 131 of the Public Health Act 1875, by becoming destitute and receiving poor-law relief.

The wisdom of the retention of the words 'by order of a justice' in Section 33 of the Municipal Corporations Act of 1882 is therefore questionable. It is highly important that no impediment should be placed in the way of the isolation of persons suffering from infectious diseases, and the clause with these words omitted would have rendered it clear that a burgess would not lose his vote by voluntarily allowing himself to be removed to a hospital. 'Perhaps,' as a commentator on the clause ob-

* See SANITARY RECORD, Vol. ix., p. 259.

the clause as it stands saves the right of the volunteer, for it would be contrary to common hold that a volunteer, who confers a benefit of immunity, should stand in a worse position than an obstinate neighbour, who has to be compelled to bear the serious risks attendant upon delay, to the law.' At any rate, this is the view which the people would take of it.

The principle above indicated received renewed sanction in the Diseases Prevention (Metropolis) Act of 1847, which contained a clause—designed to enable the use by the independent poor of the hospitals established under the Act—providing that 'the person of a person suffering from infectious disease, and being admitted into any hospital ship provided by the Board of the Metropolitan Asylums District, or the maintenance of any such person therein, shall not be considered to be parochial relief, alms, or charitable allowance to any person, or to the parent or guardian of any such person, or his parent or guardian, and no such person or his parent or guardian shall be deprived of any right or privilege, or be subject to any disability or disqualification, by reason thereof. And such an immunity ought certainly to be of general application throughout the country.'

It is pointed out that the House of Lords may throw out clauses in the Registration Bills of which the principle has been spoken above. If so, disqualification by reason of medical relief may yet become a party watch-word; and use of its intrinsic importance (which is not because it chances to affect a question to the electorate. Sir Charles Dilke explained to Mr. Commins in the course of the Franchise Bill of last June, his willingness to support the Bill for removing the existing disabilities in respect of certain kinds of medical 'relief,' though it did not assent to the insertion of a clause with the matter in the Franchise Bill. Any mishap prevent the clauses in question appearing in the Registration Bills as they have the Royal Assent, it would seem well to place on the authority of the Government Mr. Charles Dilke's Bill of 1878. The present novelty of the law is a legitimate grievance to an elector, who may be compelled to accept of himself or his family the benefits of isolation in the public expense. It was found necessary to state in the Vaccination Act of 1853 that the performance of vaccination at the cost was not to be considered as 'parochial relief, or charitable allowance,' and no one was privileged on that account of 'any right or privilege, or be subject to any disability or disqualification.' It cannot be seriously contended that any difference in principle between the provision of vaccination and the precaution of isolation, one certainly ought to be as free from the pauperism as the other in the eye of the law.

Forfar Sewage Farm last year showed a balance of £100. The thirty-eight acres cost the town £3,600 per acre purchase money. The working expenses were: horse labour, £31; manual labour, £155 9s. 10d.; repairs, £10; auctioneer's commission, £24 5s. 2d.; total of £220 15s. The receipts were—for £12 6s. 7d.; carrots, £15 7s. 3d.; hay, £3 15s.; 189 1s. 11d.; rent of field, £27; sand and gravel, being a total of £509 12s. 6d. This leaves a profit of £288 17s. 6d., or £7 9s. per acre for interest and apparently also for management.

DEFECTS IN WATER LAW.

PATCHED AND UNPATCHED.

THE question of the law governing water companies has of late achieved a quite phenomenal importance. For well nigh forty years water consumers have been putting up with the antiquated and imperfect regulations imposed by the Water Works Clauses Act of 1847, and it was not until the indomitable Mr. Dobbs gained his signal victory over the Grand Junction Company that public attention was seriously directed to the subject. Last year Lord Camperdown made a spirited attempt to obtain legislative relief as regards particulars of the companies' demands, and the cutting off of water supplies; and Mr. Torrens sought to make the dictum of the House of Lords as to the meaning of 'annual value' have universal application. Both Bills perished in their birth last year; but they have been resuscitated this session with some success and with strong expectation of their ultimate vitality. For Lord Camperdown has engaged single-handed—with the fitful exception of Lord Bramwell's peculiar vein of criticism—in a seven days' conflict with the representatives of the water companies, and has emerged less damaged than might have been expected, though with his beloved Bill changed beyond recognition in the process. A blue-book of considerable size has been issued, which is called by courtesy 'The Report of the Select Committee of the House of Lords on the Water Companies (Regulation of Powers) Bill.' It really consists of a faithful microphonic reproduction of the whole of the talk that went on during the seven days that the Bill was on its trial. Anyone who has the patience to read 170 pages of diluted Ollendorff may gain from this 'report' an idea of the mode of transmutation of the several clauses in the Bill.

Lord Camperdown's object was to say plainly in the Bill what he wanted—viz., that the companies should give to consumers particulars of the claims made upon them, and that a stop should be put to the arbitrary cutting off of the supply for neglect to pay the water-rate. As may readily be conceived, this was much too direct for the companies; and accordingly the Bill as amended contains fourteen clauses instead of five, and is more than four pages long instead of one and a half. It is not easy to make its exact purport clear in a short abstract; but its essence is, that after next Christmas every water company trading for profit (Scotland and Ireland for some inscrutable reason are omitted from the operation of the Bill) will be obliged to deliver to every person liable to the payment of water-rate a demand note.

Such note must contain a statement of the particulars of the demand, including the rental, annual value, or other basis on which the premises are assessed, and the percentage on such value, together with all additional items of the amount claimed. These particulars are to be repeated at intervals varying with the value of the premises. Within twenty-one days it will be in the power of the consumer to object to any part of such demand, but he must specify his objections and the sum which he is willing to pay. The admitted portion of the claim he will be bound to pay forthwith, and if after fourteen days' notice he does not pay it, the company will no longer be bound to supply him with water. As to the disputed portion of the claim, the case will have to be taken for decision by a court of sum-

mary jurisdiction. These provisions apply only to the ordinary supply of water, and not to water supplied under agreement.

Section 74 of the Act of 1847 provides that if any person supplied with water or liable to pay water-rate neglect to pay such water-rate at any of the said times of payment, the water company may stop the supply of water by cutting off the pipe, or by such other means as they may think fit, and may in addition recover the rate, together with the expenses of cutting off, as well as the costs of recovery. This clause has undoubtedly been grossly abused in the past. Under the modified plan approved by the Select Committee, where the owner and not the occupier is liable by law or by agreement to the water company for the payment of the water-rate, it will not be competent to the company to cut off the supply on any ground whatever. The water-rate is, however, to be a charge on the premises, and the occupier will be authorised to pay the rate and deduct it from his rent. This will provide against the very serious inconvenience now suffered by many poor tenants whose landlord undertakes to pay the water-rate but fails to do so. At present the unfortunate tenants are deprived of the first necessary of life because their landlord and the company happen to fall out with one another. If Lord Camperdown's Bill should pass, this will no longer be the case. It is made unlawful for the company to cut off the water supply except as expressly provided by the Act; and in all cases when they may lawfully cut off the supply, the company is given a power of entry upon the premises between 9 A.M. and 4 P.M.

Mr. Torrens' Bill is in a somewhat different case. It has met with a certain amount of opposition in the Commons, but was pressed gallantly forward through committee at something past three in the morning on May 1. This Bill also is barely recognisable in its amended shape. As originally drafted it proposed that the words 'annual value' in Sect. 68 of the Waterworks Clauses Act of 1847 should mean the 'net annual value,' as settled by the local authority. There is no need for us again to set forth in orderly array the arguments upon which the House of Lords finally declared for Mr. Dobbs. The essential justice of that decision has been made abundantly manifest; and Mr. Torrens' Bill, which has the support of the Government, is a natural corollary to it. In committee some sweeping amendments were made; and the Bill now provides that the 'annual value' in Sect. 68 shall within the metropolitan area mean 'the rateable value as settled from time to time by the local authority as duly constituted.'

Sir Sydney Waterlow, in suggesting the substitution of 'rateable' for 'net annual' value, as originally proposed, pointed out that the local authority—acting through the assessment committee—had no power to assess the annual value, but they were called upon by the Act to fix gross value and rateable value. This object was to place the water-rate on the same basis as other rates, and that it should be fixed by an authority which had no interest in the matter—viz., the assessment committee. 'Net annual value' could only be defined by the water companies, and contentions would constantly arise between the companies and the shareholders; but if the words 'rateable value' were inserted there would be an assessment which could be easily understood.

Mr. Firth would have added a proviso that 'where on any re-assessment of the metropolis under the

provisions of the Metropolis Valuation Act, 1869, the assessed net annual value of any tenement was increased by the assessing authority, no water company should be entitled to charge any higher or further rate in respect of such increase, except where such increase is in respect of structural or other alteration of the premises, or in respect of other matters than unearned increment of value.' The House of Commons was too tired, however, to go into the ethics of this question of re-valuation, and rejected Mr. Firth's proposal, and rejected the clause.

It would seem from the above that we have really some solid grounds for hoping that certain of the grosser anomalies and deficiencies of our waterworks law will be rectified this session. But at best Lord Camperdown's and Mr. Torrens' Bills will be but patchings; and the general question of the privileges and responsibilities of companies who deal for their own profit in an article of prime necessity to every householder is left practically untouched. We have no space on the present occasion to deal at large with the defects of water law; but there are two points that have recently cropped up in connection with it which may profitably engage our attention for a few moments.

Half a million people in South London had a narrow escape in the third week of April from a water famine, the mains of the Lambeth Company having in some extraordinary manner both burst almost at the same time. It appears, from the explanation of the matter given by the officials, that the company have recently laid down a third 30-inch main from their filtration and pumping works at Long Ditton to Brixton, so as to ensure an ample supply of water in the case of accident to either of the other two 30-inch mains. The third main is nearly finished, and the first main was stopped on Monday, April 21, in order that connection might be made between it and the new main. This work occupied about two days, but as the reservoirs were full, and the second main was at work, no difficulty in giving the supply either in town or country was apprehended. On the following Tuesday, at eleven o'clock in the day, the second main burst, and this was not repaired until eleven o'clock on the Wednesday. The connection having been finished on Tuesday at ten at night, the first main was pumped through, but at one o'clock on Wednesday morning that also burst, and was not again available until three o'clock on the Thursday morning. It was some days after this, however, before the water consumers of the district got their normal supply.

It would be idle to speculate how far this untoward accident, which might easily under different circumstances have become a very serious matter for the extensive district served by the company, would have been preventable if proper precautions had been adopted by the officials. Doubtless Sir Francis Bolton, the Government water examiner, will make such inquiry into the matter as is now possible. But the incident gives rise to unpleasant speculations as to the helplessness of Londoners in the event of their water supplies failing for a period sufficiently long to cause more than discomfort and annoyance. The company would, we suppose, hold themselves protected by the last clause of Sect. 36 of the Waterworks Clauses Act of 1847, which saves them from any penalty for not supplying water for domestic purposes, 'if the want of such supply shall arise from frost, unusual drought, or other unavoidable cause or accident.' The same phrase appears in Sect. 13 of

Waterworks Clauses Act, 1863, with regard to uses for other than domestic purposes, as well Sect. 15 of the Metropolis Water Act, 1871, with regard to constant supplies. Probably the neglect of a main must be regarded as an 'unavoidable accident'; but, the main being burst, for how would the company be held protected by Sect. 36 of the Act of 1847, if they could not or not immediately repair the mischief?

Now suppose the flow of water through the pipes stopped for a fortnight, but the water-rates running as of time. Who is to gauge the responsibility of the company for the delay, and to bring them to book?

It may be answered: the Government water-works. But the water examiner's duties are very limited by statute, and he could only report to the Local Government Board, who might not be ready to press for penalties against the company. While, the water-cisterns in the houses would be empty, and there is apparently no power on the part of anybody to insist upon water from some company's mains being supplied to the sufferers. As to what constitutes an 'unavoidable accident or accident,' there is no legal precedent for us. We have searched Michael and Will's 'Relating to Gas and Water' and other sources for information on this point, but in vain. What can be said is that the whole question of control of the joint-stock water companies is highly unsatisfactory position, and ought to attract the speedy attention of Parliament.

There is another legal question connected with water undertakings to which a recent epidemic of diarrhoea at Hull gives some interest. Between ten and twenty thousand people in that town died a few weeks ago from diarrhoea, undoubtedly due to the drinking of water polluted by sewage-fed beck, and there is some talk of action on the part of the sufferers suing for damages. We have often been asked as to the liability of companies for supplying polluted water that may have been the cause of an epidemic of specific disease; and a correspondent asks us the question this very day. The point will not be found discussed in the books, for the reason, perhaps, that there is no liability. Theoretically, no doubt, it would be that Lord Campbell's Act (9 & 10 Vict., c. 3) must apply to cases of this sort—that actions for damages are maintainable against water companies by the families of persons whom any wrongful neglect, or default of such companies has killed; and of course, that the person himself, if injured but not killed, can have his own action for damages. The difficulties in taking any such course at law are extreme.

The proof generally as to the epidemic might be complete; it might be shown to the satisfaction of a jury that a fever or cholera outbreak in mass had been caused by the distribution of certain water, which the company had suffered to be polluted with sewage; but with all this clearly established as to the epidemic generally, it might still be very difficult for any individual victim of the company's malfeasance to prove (if this had to be done) that his particular attack came from the operation of that and no other cause. The question is a highly important one from the point of view of the consumer; and, in any proposal for the amendment of the law that governs water undertakings, careful and neglectful distribution of polluted water should be made punishable in a much greater degree than at present.

BURIAL SOCIETY INSURANCE.

INDUSTRIAL insurance, and especially the insurance of infants, is a social question which is daily assuming greater importance, and which must, sooner or later, be made the subject of a searching and thoroughly independent investigation. The abuse of the present system, which mainly exists for the benefit of rival companies whose agents carry on such reckless competition in their struggle for new business, is patent to all who know how the system is worked. It is, however, only now and then that the public conscience is awakened and shocked by such revelations as those at the recent criminal trials at Liverpool, Durham, and Warrington. In a recent lecture on Life Assurance, Mr. Arthur J. Cook calls attention to some of the unlawful acts which result from the excessive competition which prevails. The proposal-forms for membership of the industrial companies and burial clubs contain questions which should be answered, and signed, by the person whose life is to be insured. Mr. Cook, however, expresses his conviction, from personal knowledge acquired in many parts of the country, that 'the lives of thousands of husbands have been assured by their wives for sums up to the limit for which a medical examination is not required,' the supposed signatures, or marks, of the husbands upon the proposal-forms being those of the wives, when they have not been written by the agents themselves. The recent notorious case at Liverpool, in which the two women, Flannigan and Higgins, were convicted of assuring the husband of the latter for several sums, and then poisoning him, threw much light upon this vicious and dangerous system. Under the present state of the law, a policy effected by persons having no interest in the life assured is null and void; but this does not check the kind of insurance that led to the Liverpool murders. Mr. Cook suggests that the effecting of an insurance by an uninterested person should be made illegal.

The connection, if any, between infant insurance and infant mortality has been much and frequently discussed, and at the Social Science Association meeting at Birmingham, last autumn, very strong opinions were expressed as to the effect of infant insurance. The extent of competition in this kind of assurance may be judged by the following fact, quoted by Mr. Cook, in his lecture above referred to. Some time since the *Sheffield Independent* announced that a woman in the district had given birth to three children. Two days afterwards the same journal stated that it had received a letter, advising that in future a similar event should not be so announced, as the announcement of the birth of the three children led to more than one hundred agents calling at the house of the parents to assure the lives of the children.

It is very seriously to be regretted that thoroughly trustworthy mortality statistics of insured infants are not available, and, we had almost said, are not possible. The wholesale 'surrender' of industrial insurance policies appears to vitiate all attempts at such calculations. Such statistics as have been published have usually been issued by the societies doing this kind of business, which financially is as immoral as socially it is dangerous. In connection with this subject our attention has been called to some statistics prepared by Mr. R. Farrow, of Leek, and produced by him at the annual general meeting of the Leek Benevolent Burial Society, which ap-

pears to have done an increased and profitable business during last year, 1,534 additional policies having been issued. The subject recently attracted considerable attention, owing to the assertion of Mr. Ritchie, the medical officer of health, that infant mortality in the town had increased in a startling degree since the insurance of children's lives had become common. Mr. Farrow, it appears, had obtained permission to examine the books of the Leek Burial Society, and had computed statistics of the mortality of insured infants since the society commenced insuring infants in 1880. The result of Mr. Farrow's investigations he stated as follows:—In 1880 the mortality of insured infants was only 88 per 1,000, against 175 in all Leek; in 1881 it was 90, against 137; in 1882 it was 148, against 193; in 1883 it was 104, against 118; and in 1884 it was 112, against 185 in all Leek. This statement seems almost too favourable to infant assurance to be trustworthy, and is still more remarkable than the statement put forward on the same subject a few years ago by the Prudential Society. The subject is one of so much importance that we should be glad to have further information as to Mr. Farrow's method of calculation, including a statement of the manner in which lapsed policies were dealt with.

NOTES OF THE MONTH.

HIGH BUILDINGS AND PUBLIC HEALTH.

IN the great cities of America, particularly in New York, where by reason of the position of the city an all-round extension is impossible, the tendency to build very high structures is naturally strongly marked, and the use of the lift or elevator materially lessens the discomfort necessarily entailed upon those who would otherwise have to reach the upper stories by means of a staircase. A Bill is being considered by the 'Cities Committee' for the regulation of the dwelling-houses in proportion to the width of the streets, the Bill providing that buildings of this class shall not be higher than 70 feet in streets of a width of 60 feet, and not higher than 80 feet in streets exceeding 60 feet in width. Builders and manufacturers, of course, oppose the restrictions, and the supporters adduce the usual arguments as to the danger of infectious diseases, danger from fire, and the exclusion of light and air; on the other hand, several New York physicians are of opinion that the sanitary arrangements of the modern buildings known as apartment-houses (or as we term them 'flats') are equal or superior to those of houses generally in the City of New York, and that houses with elevators have not only proved to be a great convenience but of material benefit to both men and women afflicted with diseases which are aggravated by going up and down stairs, and that any statements made to the effect that the erection of tall apartment-houses has materially injured, or is likely to materially injure, the health of the public by obstructing the sun-light, and thus fostering malarial and other diseases, are largely fanciful and not justified by the facts. Although there is a certain amount of danger to health in these high buildings, it must not be assumed that in our own country the danger increases in inverse ratio to the altitude, as it can be clearly shown that even from the speculative builder's point of view, apart from the regulations of the Building Act, an appreciable amount

of light and air must be preserved to induce people to occupy such apartments, and it is an admitted fact that our flats are, as a rule, sanitariously speaking, by far the best arranged of all residences. Another point which prevents extravagant altitude is the vested right to light and air usually enjoyed by the opposite neighbours, and they are always keenly alive to their position, and protect themselves accordingly, so much so that an *ex parte* injunction to restrain the building operations is very easily obtained, and such an injunction can be made permanent if fair grounds are shown for its desirability. As regards danger from fire, it is proved that 75 feet is a limit beyond which the firemen cannot reach with any hope of success in saving life or subduing the flames. This seems to be the most serious aspect, but fires in flats are comparatively few and unimportant, owing to the precautions hereafter stated. In these cases fireproof construction, partial or whole, is enforced by the Metropolitan Building Act if the building exceeds a certain size, not that fireproof construction implies a fireproof building in reality; the materials being iron, concrete, brick, or stone will not, of course, ignite, but they may be slowly consumed if the amount of inflammable material contained in the building be sufficient to destroy its surroundings. A building to be absolutely fireproof should bear somewhat the same structural proportion as an ordinary domestic fire-grate does to the coal fire contained therein, that is to say, it must be able to hold the mass of burning material harmless and safe for an indefinite time; however, the space occupied by such construction and the expense also must ever prevent such a result being obtained. But to return to the mitigation of the danger as provided for in the Act. In every public building, and in every other building containing more than 125,000 cubic feet, and used as a dwelling-house for separate families, the floors and the lobbies, corridors, passages, and landings, and also the flights of stairs, shall be of stone or other fireproof material, and carried by supports of a fireproof material. Thus, a building 75 feet high, 40 feet frontage, and 42 feet depth (by no means a large or unusual size), would contain 128,000 cubic feet, exceeding the above limit by 3,000 feet, and would therefore be constructed of so-called fireproof material in respect of the items enumerated, but wooden floors to the rooms would be allowed. This, however, would generally be met by the further provision that separate sets of chambers or rooms tenanted by different persons, shall, if contained in a building exceeding 3,600 square feet in area, be deemed separate buildings, and be divided accordingly, that is to say, each tenement or set shall be divided from the adjoining one by a party wall (which is to be of the same thickness as the external wall of the building, this in turn being regulated by the height to which the wall is carried) and each such tenement or set to be divided horizontally from the adjoining one by party arches or fireproof floors. For instance, a block of flats being 100 feet long and 37 feet in depth (irrespective of height) would exceed the limit by 100 feet, and would accordingly come under the above regulations; in addition to this the form of construction must meet the approval of the district surveyor, and in the event of disagreement the decision of the Metropolitan Board of Works is practically final.

With regard to the areas for ventilation and light, the Act somewhat favours the builder, as until 1882

t of lighting area bore no proportion to the building, for where all the rooms were lighted from a street or alley, an open area of 100 square feet was required at the rear (and belonging exclusively to) the building, taking into consideration the size of the building.

This portion of the Act received sanction in 1882 in which it is enacted that a building having a frontage of 15 feet shall have an area (at the back or side) of 150 feet, and proportionately until the frontage exceeds 30 feet, an area of 450 feet shall be provided, this last limit that is specified, and here again it is in direct proportion to the height. In dwellings the poorer classes these restrictions are sufficient from a sanitary standpoint, but in sewerage work it is usually found profitable to extend to more liberality of surrounding area. It may be concluded that these high building regulations and common sense in their regulation need not be supposed that builders can on their own way unchecked, the restrictions and the result being such that a very unsanitary state cannot therefore be so readily brought about as are sometimes asked to believe.

AS AN ECONOMISER OF COAL.

Discussion of the coal supplies of the country has been the subject of discussion in some of the newspapers between Mr. Ellis Lever, of Lancashire, and Mr. Thomas Newbigging, the director of the Gas Institute. Mr. Lever is a waste in getting the coal and in using it, whilst Mr. Newbigging is of opinion that the supply is not so close upon the point of exhaustion as many people suppose. Replying to Mr. Lever's offer of a sum of 20*l.* for the best essay to be read at the forthcoming meeting of the Gas Institute in Manchester, on the 'Economising Coal by the more extended use of gas for domestic and manufacturing and for the generation of steam.' Mr. Newbigging, in his official capacity, has accepted this subject to be one of vast importance, and must be carefully considered, are doubtful of the premium of 20*l.* is a sufficient inducement for the preparation of an exhaustive paper. They, however, liberally propose to supplement that sum, or, alternatively, give a premium of 50*l.* for the paper, when the 20*l.* offered by Mr. Lever is awarded as a second prize.

THE PERILS OF PLATE GLASS.

It might seem strange that a man should be crushed to death by plate glass, but such accidents have occurred ere now. In the time of the Romans this material was very difficult to cast, and a piece of 5 or 6 superficial feet was the largest that could be made; at the present time, however, it is nothing to find a number of sheets or plates each of as much as 140 superficial feet, packed together, each plate representing perhaps 5 cwt., and such plates will weigh a ton. These are supported against 'horses,' or strong wooden frames, inclined on each side, so that the plates are set out of the perpendicular—say 3 or 4 inches—shifted one by one as they are required for

use. It becomes evident that care must be exercised in their handling, and in shifting them over from side to side; also the danger of attempting to deal with more than one at a time becomes obvious. The difficulty may be compared to a man attempting single-handed to move a heavy ladder from one side of a street to the other. In trying, as men sometimes will do, to 'steady' several plates at one time perpendicularly, perhaps to examine one nearest the 'horse,' the centre of gravity is overcome, and the crushing weight of the falling glass gives no chance of escape unless the man be sufficiently quick to jump aside and let the glass fall. An escape of this kind recently came to notice, and 150*l.* worth of glass was destroyed, but a similar case previously resulted in loss of life. In another instance, the glass from the first 'horse' fell against the second, which in turn carried away the next, and so on through the series, like a house of cards, the damage being estimated at 1,000*l.*, but fortunately causing no serious injury to the workers. Workmen employed in these warehouses often get severely cut, but of which they seem to take but little notice, except in cases of great severity, which sometimes happen. In domestic use the danger of this material was instanced some time ago by the fact of a man having walked through a plate glass door separating a conservatory from the main portion of a house at Kensington, the door being foolishly constructed in such a way that the impediment would not be noticed by a casual observer, and in this case the unfortunate being paid the penalty with his life. Here, as in other improvements in manufacture, the 'inevitable tribute' must be paid, and that, too, without a moment's warning.

PREVENTION OF FIRES IN THEATRES.

FOLLOWING up the remarks in the SANITARY RECORD of March 15 (p. 408), it may be useful to call attention to the hints given by Captain A. W. Shean, the consulting engineer to the Metropolitan Fire Brigade, for the prevention of fires in theatres. In the first place, it is argued that at any moment the audience should be able to quit the building in three minutes, and *this must be known*. 'If thousands of pounds sterling can be expended on the production of a single piece, a few hundreds, it can be argued, may very safely be expended in rendering such safety as alone will prevent panic—that is, a sudden conviction of danger produced by fear, aided by alarm, and preventable by an indisputable knowledge of personal safety.' Rapid egress must necessarily be rendered palpably easy, and it is suggested that instead of doors there should be substituted curtains of carpet. Such doors as must of necessity be used should open outwards, and be lightly constructed of wood and glass; but the breaking of these materials, or anything likely to increase terror, must, of course, be carefully studied. Draught would be prevented by these carpet-curtains, and if wetted they would resist the fire better than wood; the expense need not be considered. It is pointed out that the seats at many theatres, notably the stalls, are dangerously close together; and if perfection is to be approached, all seats should be licensed. An overcrowded theatre is more dangerous than an overcrowded vessel; although the danger of the former is not so apparent, it is none the less formidable. As the fire usually makes its appearance first on the stage, the scenery should be

rendered non-inflammable by the application of a solution of tungstate of soda, made of 1 lb. of the salt to one gallon of water. This invaluable agent appears to have been used at only one theatre in London. Another recipe from the *Chemists' and Druggists' Diary* is given as follows:—Four parts of borax and three parts of sulphate of magnesia, mixed together just previous to being required—otherwise, insoluble borate of magnesia is formed too early—and then dissolved in from twenty to thirty parts of warm water, into which the fabrics are to be immersed, next wrung out, and then dried. For coarse fabrics a mixture of sulphate of ammonia and gypsum may be used. Mr. A. J. Martin, of Paris, has succeeded in rendering textile fabrics—even such materials as muslin, tarlatan, and lace curtains—uninflammable by the application of the following mixture:—Sulphate of ammonium, 80 parts; carbonate, 25 parts; boracic acid, 30 parts; borax, 17 parts; starch, 20 parts; water (distilled or rain), 1,000 parts. The first four ingredients are to be dissolved in one-half of the water, while the starch is boiled in the remaining portion until fully gelatinised; the two solutions may then be mixed, raised to the boiling-point, and then, while hot, applied to the fabrics, or to wool or paper. Wood may be rendered incombustible by soaking for four or five days in a solution of one pound of alum and one of sulphate of copper in 100 gallons of water. The fireman in attendance is considered to be underpaid, and further encouragement generally should be offered him. The heavy premiums paid for fire insurance in these cases point to the conclusion that it would be wiser for theatrical managers to combine and form a 'mutual fire insurance,' as ten years' insurance premium of every London theatre would be sufficient to build a very handsome structure. Captain Shean further states that all the suggestions made could be carried out free of cost out of the premiums now paid to companies, in the success of which the managers do not participate, and in a few years a very handsome bonus might even be divided. Ways and means being thus considered, there should not, under the pressing necessity, be any difficulty in finding a response.

THE SWEATING SICKNESS.

AN antiquarian correspondent, who has more sympathy with the conservancy of the Grecian camp before Troy, and with the personal habits of St. Simeon Stylites, than with the sanitary problems of the present day, reminds us that this year is the quadcentenary of the first invasion of England by the 'sweating sickness.' Happily this is one of the epidemics that have now no more than an historical interest for us.

It seems to have prevailed on its first appearance in 1485 mainly in Lancashire, though it was also recognised in other parts of the kingdom. It made its appearance about the middle of September, and happily had run its course before the end of October in the same year. Lord Verulam described it as follows:—'The complaint was a pestilent fever attended by a malign vapour, which flew to the heart and seized the vital spirits, which stirred nature to strive to send it forth by an extreme sweat. If the patient were kept in an equal temperature, both for clothes, fire, and drink, moderately warm with temperate cordials, whereby nature's work were neither irritated by heat nor turned back by cold, he commonly recovered, and the danger was considered as

past in twenty-four hours from the first attack. But infinite persons died suddenly of it before the manner of the cure and attendants were known. It was conceived not to be an epidemical disease, but to proceed from a malignity in the constitution of the air gathered by the predisposition of seasons, and the speedy cessation declared as much.'

GAS SUPPLY BY POOR-LAW AUTHORITIES.

A GREAT deal of unnecessary fuss appears to have been made about the decision of the Holborn guardians to construct gas-works at Mitcham for the purpose of lighting the large workhouse to accommodate one thousand paupers, which they are building on the land adjoining their district schools at that place. As a matter of fact, large institutions all over the country are accustomed to manufacture gas for their own consumption, although, perhaps, this is the first occasion on which a board of guardians has gone into the gas trade. It is commonly supposed that a gas company, having once received powers to supply a certain district with gas, has the monopoly of supplying that district. No doubt such a company is practically secured from competition by the necessity which exists for a rival company to apply to Parliament for the necessary powers; and except in the most aggravated case of neglect on its part to fulfil its obligations, no other company would probably be authorised by Parliament to supply gas within the same area. But it is competent for any individual or body of persons without Parliamentary authority to set up gas-works, and to supply gas within an area already occupied by a company. In such a case the sanction of the road authority in whom the streets and roads are vested must be obtained, and the undertakers who open the streets to supply gas without Parliamentary authority must be prepared for an indictment for nuisance whenever the pavements are disturbed, in order to lay a supply pipe for the use of any consumer. The High Court of Justice would not interfere by injunction to prevent the establishment or working of such a company on the motion of any individual or company, but would allow the law to take its course in each individual case of nuisance. Great employers of labour, or great companies, such as railway companies supplying gas to their own works and their own employés, and having a surplus supply, without in any way acting *ultra vires*, not infrequently step over the boundary of their own property and supply inhabitants of adjacent districts with gas, although within the limits of supply of an authorised gas company. Perhaps the Mitcham pauper gas may be so good and so cheap as to encourage the local residents to transfer their custom from the gas company to the Holborn Guardians.

GIPSIES AND SMALL-POX.

IT was recently asserted with some show of authority that gipsies were, for reasons which were not explained, specially insusceptible of small-pox. This we believe to be contrary to all recorded experience, though the facts are not very numerous to support either contention. Dr. Thursfield, who has a large district in Shropshire, says that he is unable to endorse the theory that gipsies have any special immunity from the infection. A few months back a small tribe of gipsies, encamped in a part of his district where at the time there were some cases of

small-pox, were reported to have small-pox in the camp. The tribe, possibly hearing of an intended visit from the sanitary officials, suddenly decamped, and continued moving from day to day until compelled by the spread and severity of the disease to halt some days after at a distant spot in an adjoining county. Here there was no doubt as to the nature of the disease; one case proved fatal, and the necessary measures to efficiently isolate the camp entailed considerable expense on the local sanitary authority.

A PHYSICAL TEST FOR BUTTER.

M. RABOT, a chemical expert, affirms in a communication to the Société d'Encouragement des Sciences, on butter analysis, that all the chemical processes of ascertaining the falsification of butter are unsatisfactory, excepting that of a thorough analysis, which is a long and delicate process. M. Rabot indicates a special physical character which enables the observer in a few minutes to distinguish pure butter, unadulterated butter which has been melted, butter mixed with margarine, pure margarine, also tallow which is often mixed with butter, and oleine instead of margarine. The crystals of solid fatty acids depolarise the sun's rays; these crystals are not found in natural unadulterated butter, they belong to more solid acids and are luminous and are differentiated from the surrounding substance, which is non-luminous. Butter becomes rancid when it contains butyric acid—a volatile fatty acid, which has no influence on polarised light. Chemical analysis is now necessary only to determine the extent of adulteration. M. Rabot also suggests improvements in the analytical process.

THE DISUSED BURIAL GROUNDS BILL.

THE London, Tilbury, and Southend Railway Company, which, as stated in the SANITARY RECORD of April 15, proposed to acquire the disused burial-ground of the Mill Yard Chapel as a site for a shunting-shed, siding, &c., has been foiled in the attempt to override the provisions of Mr. Holland's Act. The promoters gave way before the serious opposition which they met with in the House of Commons, when the motion for the rejection of their Bill was supported by Mr. Holland, Mr. Ritchie, Mr. Bryce, Colonel Makins, and other members. There is a clause in the Disused Burial Grounds Bill which prevents the application of the Act in any case where Parliamentary powers have been sought for before the passing of the Bill, and the company believe that this renders their conduct and that of the trustees, who are anxious to sell the ground, legal. At the present time their powers have lapsed, but it is not unlikely that they may again apply for power to take the disused burial-ground for railway purposes, notwithstanding the likelihood of being thereby involved in serious litigation.

WORK FOR THE UNEMPLOYED.

THOSE who may wish to see some seventy or eighty men, who have been without employment through no fault of their own, but only from the general slackness of work and the surplus number of workmen, busied once more in a most useful and steady manner, should visit the grounds now being laid out by the Metropolitan Public Garden Association.

Through the benevolence of one lady this association has started a special fund for giving work to the unemployed labourers of London, thereby relieving some of the present distress, and at the same time carrying out the various schemes on hand. The services of Mr. Arnold White, whose great experience in such matters is well known, have been secured, and under his guidance suitable men have been selected. They are engaged at 4d. per hour, and work for eight or nine hours daily; they are easily instructed in the arts of painting railings, digging and levelling ground, &c., and, in each place, are under the control of a competent foreman.

Mr. Arnold White, after a series of minute investigations, has ascertained that 40 per cent. of the so-called 'unemployed' are quite unwilling to work, and find it more pleasant and more lucrative to remain without any occupation. He estimates that another 40 per cent. are physically unable to work; they are too old or too sickly. This leaves only 20 per cent. both willing and able to be regularly employed, and, small as the percentage may seem, it is nevertheless a correct estimate. From this class the association has naturally drawn its labourers, but it is also employing, as night-watchmen, &c., a few of the second class, the men who are willing to work but are physically disabled. In this way a double blessing is conferred upon the poor of London; occupation is being given to those who deserve it, and recreation-grounds are being made for those who so sadly need them. When it was known that a few hands were wanted at Wilmington Square, Clerkenwell, 800 men, at less than a day's notice, applied for the work. There are, at the present time, many thousands of men, often fathers of families, who have been seeking for work for months past without being able to find it, and the number is unfortunately daily added to by those who flock into the metropolis from the country parts of England, and who find out, only too soon, the great mistake they have made.

Among the places which the association is now laying out, and where the 'unemployed' may be seen at work, are Canonbury Square; Wilmington and Northampton Squares, Clerkenwell; Trafalgar Square, Mile End; and the ground attached to St. Paul's Chapel and Schools, Rotherhithe. In Red Lion Square, Holborn, and the East London Cemetery, the work will shortly be commenced, and, as soon as the faculties are obtained, it is hoped that the churchyards of St. Peter, Walworth, and St. James, Bermondsey, will be laid out. In each case a band of deserving workmen, under an experienced foreman, will be employed to make such alterations and improvements in the several grounds as are considered necessary in order that they may be opened to the public as gardens for adults or playgrounds for children.

RAILWAY EXTENSIONS IN THE METROPOLIS.

THERE is now before Parliament a Bill which, if it should receive the Royal Assent, will help to double the facilities for artisans to live out of London proper. This Bill is one giving power to the Regent's Canal, City, and Docks Railway Company to pay interest on the capital required for its undertaking during the construction of its lines, which are to run from Paddington in the west to the Barbican in the City, and thence eastwards to the Docks. As

to the scheme itself, we have nothing to object, but rather everything to approve. The building of the line would no doubt afford employment to a great many people who are now out of work; and, when constructed, it would possibly assist to widen the area on which it is now possible for the working-man to seek a home, whilst keeping in view the paramount necessity of being within reasonable hail of his work. But we cannot forbear a criticism on the absolute unreality of the debate on the second reading of the Bill which took place on the 1st instant. Be it remembered that the question was not whether the line might be authorised (that was settled three years ago); but whether there was sufficient force in the contention of the directors that they could not raise the necessary capital, unless they were allowed to pay interest on it while the line was building and therefore unproductive. Certain philanthropic members (who chanced also to be directors of the great trunk lines) had interested themselves in the cause of the innocent and childlike investor, and sought to prevent his (more frequently her) falling a prey to the sophistries of those bold, bad men who offer to pay interest on capital during construction. In opposition to these were arrayed all the benevolent persons who desire to find labour for the unemployed, and who repine that mouldy traditions of Parliament should prevent work in plenty being given to thousands because the capital required for an undertaking cannot be raised unless interest is allowed to be paid while the line is building. The arguments of the railway members on either side were equally insincere. There is no valid reason why a Company already established should be allowed to raise money for new lines, and pay at once interest on it by thinly disguising the capital as preference, or some device of that kind, whilst a new Company is not allowed to do the same thing. On the other hand, it must be pointed out that a group of astute financiers will be in difficulties under their agreements for buying properties unless they can make a start without delay on the construction of their authorised lines, and so they set up the cry of work for the unemployed. Whilst we have little or no regard for the *bonâ fide* investor, who sins quite as often as he is sinned against, we have the keenest sympathy with the unemployed poor who have now so desperate a struggle for existence. We are glad, therefore, that the Bill has been allowed to pass the Committee; though we hope some clause has been inserted that will pin the directors to a practical exposition of the desire to benefit the poor, which they find so useful and efficacious in their Parliamentary log-rolling.

It is significant of the growing interest which is being taken in sanitary matters in the States, that *Bradstreet's*, a well-known financial paper of New York, devotes three and a half columns of a recent number to the discussion of the sanitary and quarantine administration of Baltimore. The sanitary staff seems, from this account, to be more or less under political influence, and its powers to be in many respects insufficient. The 'greatest curse' of Baltimore is its privy pits, which number between seventy and eighty thousand, and are of all depths, from 3 to nearly 100 feet. Baltimore does not maintain constant street quarantine; this is only enforced from May to November. For disobedience of quarantine there is a fine of 500 dols. The station takes notice of yellow fever, typhus, small-pox, and cholera, and every immigrant is required to show a certificate of vaccination before landing.

THE PUBLIC HEALTH

DURING APRIL 1885.

THE mean temperature during the month of April at the Royal Observatory, Greenwich, was $47^{\circ}7$; it was $1^{\circ}7$ above the average April temperature in one hundred years, and exceeded that recorded in the corresponding month of any year since 1882. An excess of temperature prevailed on fifteen days of the month, while on the other fifteen days it was below the average. The warmest day of the month was the 21st, when the mean was as high as $58^{\circ}7$, and showed an excess of $10^{\circ}5$; the coldest day was the 4th, when the mean did not exceed $39^{\circ}3$, and was $7^{\circ}1$ below the average. Rain was measured at Greenwich on nine days during the month, to the aggregate amount of 2.0 inches, which exceeded by 0.3 of an inch the average April rainfall in sixty-one years. During the first four months of this year the rainfall amounted to 7.3 inches, which was more than half an inch above the average for the corresponding period in sixty-one years. The sun was above the horizon during 414.9 hours in April, and 160.1 hours of bright sunshine were recorded at Greenwich; this amount exceeded that recorded in the corresponding month of any year on record. Easterly winds prevailed during a great part of the month.

In the twenty-eight large English towns dealt with by the Registrar-General in his weekly return, which have an estimated population of nearly nine millions of persons, 23,590 births and 15,832 deaths were registered during the four weeks ending the 2nd inst. The annual birth-rate, which had been 36.4, 35.6, and 34.2 per 1,000 in the first three months of the current year, rose again to 34.6 during April, but was below that recorded in the corresponding month of either of the three preceding years 1882-84. The lowest birth-rates in these twenty-eight towns last month were 26.1 in Brighton, 27.3 in Huddersfield, and 32.4 in Bradford; in the other towns the rates ranged upwards to 42.9 in Preston, 43.0 in Newcastle-upon-Tyne, and 46.6 in Cardiff. In London the birth-rate last month did not exceed 32.6 per 1,000, whereas in the twenty-seven provincial towns it averaged 36.2.

The annual death-rate in the twenty-eight towns, which had been 21.2 and 22.5 per 1,000 in the two preceding months, further rose to 23.2 in April, and exceeded by 1.1 per 1,000 that recorded in the corresponding period of 1884, which was 22.1 per 1,000. The lowest annual rate of mortality last month in these towns was 17.0 in Derby. The rates in the other towns, ranged in order from the lowest, were as follow:—Portsmouth, 18.8; Hull, 19.0; Brighton, 19.3; Nottingham, 20.3; Norwich, 20.7; Leicester, 20.9; Bolton, 20.9; Salford, 21.2; Birkenhead, 21.7; London, 21.9; Leeds, 22.2; Birmingham, 22.6; Wolverhampton, 22.7; Bradford, 23.2; Sheffield, 23.6; Halifax, 23.9; Oldham, 24.7; Liverpool, 24.8; Bristol, 25.3; Huddersfield, 25.4; Plymouth, 26.1; Blackburn, 27.2; Cardiff, 29.0; Sunderland, 29.1; Preston, 31.7; Manchester, 33.4; and the highest rate during the month, 36.0 in Newcastle-upon-Tyne. While the death-rate in London during April, as above stated, did not exceed 21.9 per 1,000, it averaged 24.3 in the twenty-seven provincial towns. The 15,832 deaths from all causes in the twenty-eight towns during the four weeks of April included 1,940 which were referred to the principal zymotic diseases, of which 748 resulted from measles, 490 from whooping-cough, 164 from small-pox, 153 from diarrhoea, 139 from 'fever' (principally enteric), 137 from scarlet fever, and 109 from diphtheria. These 1,940 deaths were equal to an annual rate of 2.4 per 1,000, which showed a further increase upon the rates recorded in the three preceding months, though it was below that returned in the corresponding period of 1884, when it was 3.3 per 1,000. The death-rate in London from the principal zymotic diseases was equal to 3.0 per 1,000 during April, and slightly exceeded the average

twenty-seven provincial towns, among which the death-rates ranged from 0.7 in Derby and in 0.8 in Brighton and in Wolverhampton, to 0.5 in Manchester, 5.6 in Cardiff, 7.4 in Sunderland, and 10.5 in Newcastle-upon-Tyne.

It was the most fatal zymotic disease in the eight towns during April. The rate of mortality from this disease, which had risen from 0.42 to 0.91 per 1,000 in the first three months of this year, further increased to 1.10 during April, and exceeded the rate in any previous year. In London the death-rate from this disease was equal to 1.16 per 1,000, and slightly exceeded the rate in the twenty-seven provincial towns, among which the highest measles rates were recorded in Manchester, Sunderland, and Newcastle-upon-Tyne. The death-rate from whooping-cough, which had been 0.71 per 1,000 in the two previous months, rose during April to 0.72, which was, however, slightly below that recorded in the corresponding month of last year. In London the whooping-cough was slightly below the average rate in the provincial towns, among which this disease showed the highest fatality in Manchester, Bristol, Blackburn, and London. The mortality from diarrhoea somewhat exceeded the average in recent corresponding periods. The death-rate from 'fever' (principally enteric or typhoid), which had been 0.21 per 1,000 in each of the three preceding months, declined during April to 0.20; in London the mortality from this disease did not exceed 0.15, while in the twenty-seven provincial towns it was 0.25; this disease was proportionally most fatal in London and Norwich. The rate of mortality from scarlet fever, which had steadily declined in the five months from 0.45 to 0.21 per 1,000, further declined in April to 0.20, and was the lowest on record; in London it was last month twice as fatal in the provincial towns; for while the scarlet fever death-rate in the metropolis did not exceed 0.13 per 1,000, it was 0.26 in the twenty-seven provincial towns, among which the highest rates were returned in Preston and Manchester. The mortality from diphtheria showed a decrease upon the rate recorded in the previous months; this disease was proportionally much more prevalent in London than in the provincial towns. During the weeks of April 164 deaths from small-pox were registered in the twenty-eight towns; the fatality of this disease showed an increase in London, while it had declined in the provincial towns. Of these 164 deaths from small-pox during April, 148 were registered in London, 16 in Manchester, 4 in Liverpool, 3 in Sunderland, 1 in Halifax, and 1 in Leeds. Judged by the returns from the Metropolitan Asylum Hospitals, the prevalence of small-pox in London showed a marked increase during the month of April. The number of small-pox patients under treatment in these hospitals, which had been 1,147 and 1,103 in the two preceding months, rose to 1,282 in April. The average weekly number of new admissions to these hospitals, which had been 248 in the two previous months, rose to 273 during the month of April, which was a higher number than in any month since June.

The rate of infant mortality in the twenty-eight towns, by the proportion of deaths under one year of age registered, was equal to 156 per 1,000 during the month of April, which exceeded that recorded in the corresponding months of either of the two preceding years 1883 and 1884. In the twenty-seven provincial towns the rate of infant mortality did not exceed 1,000, whereas in the twenty-seven provincial towns it averaged 165, and ranged from 104 in Hull, and 218 in Wolverhampton, 220 in Portsmouth, and 230 in Preston and in Huddersfield. The death-rate from diseases of the respiratory organs, as shown in the metropolitan returns, was below the average in April. The weekly number of deaths from these diseases in London averaged 420, and the annual death-rate was equal to 5.4 per 1,000.

In Liverpool the annual rate of mortality from these diseases was last month equal to 6.5 per 1,000.

The causes of 380 of the 15,832 deaths registered in the twenty-eight towns during the four weeks of April were not certified, either by registered medical practitioners or by coroners. These uncertified deaths were equal to 2.4 per cent. of the total deaths, which showed a decline from the proportion in the preceding month. In London the proportion of uncertified deaths was only 1.3 per cent., while in the twenty-seven provincial towns it averaged 3.3 per cent. All the causes of death were duly certified throughout the month in Portsmouth, and only one was uncertified in Plymouth; while the proportions of uncertified deaths were largest in Halifax, Salford, Oldham, and Hull.

Among the population living in the outer ring of suburban districts around London, estimated at rather more than a million persons, the annual death-rate from all causes during April was equal to 18.9 per 1,000, against 19.0 and 17.6 in the corresponding periods of 1883 and 1884. During the four weeks ending the 2nd inst., 126 fatal cases of small-pox, 38 of measles, 32 of whooping-cough, 27 of diphtheria, 15 of 'fever,' 7 of diarrhoea, and 6 of scarlet fever, were recorded in the outer ring. These 251 deaths are equal to an annual rate of 2.9 per 1,000, which corresponded with the rate in the preceding month. The fatality of small-pox and measles showed an increase during the month, while that of scarlet fever, whooping-cough, and 'fever' declined. Of the 126 deaths from small-pox recorded in the outer ring during April, 102 occurred in West Ham district (including 6 of London residents registered in the Metropolitan Asylum Hospital at Plaistow), 11 in Edmonton, 5 in Croydon, and 4 in Romford. Of the 27 fatal cases of diphtheria, 8 occurred in Edmonton, 4 in Kingston, and 3 in Hendon districts; and the 38 deaths from measles included 11 in Croydon, and 10 in Hornsey sub-districts.

NOTIFICATION OF INFECTIOUS DISEASES.

In a table on page 514 are published uniform statistics relating to sickness and mortality in thirty-one of the thirty-nine urban sanitary districts of England and Scotland in which the notification of infectious diseases is compulsory. The estimated population of the thirty-one districts for which we are enabled to publish complete statistics for the month of April is rather more than three millions of persons. The annual rate of mortality from all causes per 1,000 persons estimated to be living in these towns, which had been 21.03 and 22.05 per 1,000 in the two preceding months, further rose during April to 22.66. In the twenty-eight large English towns dealt with by the Registrar-General in his weekly return the death-rate during April averaged 23.20 per 1,000, and was therefore slightly above the mean rate in the thirty-one towns in the accompanying table. The rates of mortality last month were considerably below the average in Hartlepool, Lancaster, Edinburgh, Rotherham, and Burton-upon-Trent; while they showed an excess in Oldham, Blackburn, Preston, Manchester, and Jarrow. The death-rate from the eight infectious diseases dealt with in the table averaged 0.58 per 1,000 in the thirty-one towns furnishing this information, showing a further decline from the rates recorded in the six preceding months, which had steadily fallen from 0.98 to 0.65 per 1,000. No death from any of these infectious diseases was recorded last month in Burton-upon-Trent, Derby, Jarrow, Lancaster, Leek, or Warrington; while they caused the highest rates in Halifax, Salford, Portsmouth, Bury, and Preston. Small-pox caused 5 deaths in Manchester; scarlet fever was proportionally most fatal in Bury, Halifax, and Preston; diphtheria in Portsmouth; enteric fever in Salford and Portsmouth; and measles in Huddersfield, Manchester, and Jarrow. In the last-mentioned town a serious epidemic of measles

revails, no less than 36 deaths from this disease having been registered there during the past month, equal to an annual rate of 12.52 per 1,000. Three deaths from pueral fever were recorded in Bradford, and 2 in Salford. With reference to the notified cases of infectious disease in the thirty-one towns, it appears that the proportion of the population reported to be suffering from one or other of the eight diseases was 4.60 per 1,000, which almost corresponded with the proportion in the preceding month. No case of any of these diseases was notified in Warrington during the month, and the rate did not exceed 2 per 1,000 in Aberdeen, Accrington, Bolton, Hartlepool, Leek, and Oldham; while in the other towns it ranged upwards to 6.23 per 1,000 in Burnley, 6.32 in Portsmouth, 6.94 in Reading, 7.18 in Manchester, 9.00 in Barrow-in-Furness, 10.53 in Rotherham, and 10.72 in Leicester. The high rates in nearly all the last-mentioned towns were due to the excessive prevalence of scarlet fever. Ninety-three cases of small-pox were notified in Manchester, 6 in Jarrow, and 4 in Salford; scarlet fever was proportionally most prevalent in Halifax, Burton-upon-Trent, Reading, Bury, Rotherham, and Leicester; diphtheria in Edinburgh; typhus in Greenock and Dundee; and enteric fever in Burnley, Leicester, Nottingham, and Portsmouth. With reference to the epidemic of measles in Jarrow, Dr. Campbell Munro, D.Sc., the medical officer of health, states that no fewer than 212 cases of that disease were notified during April, and that, in consequence of the prevalence of measles, all the schools in the borough have been closed.

SPECIAL REPORTS.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

At the meeting on Friday, April 17, T. Orme Dudfield, M.D., President, in the chair,

A paper by Dr. Thomas Stevenson was read on—

SEWAGE DISPOSAL.

The author commenced his paper by expressing regret that the possibility of dealing with excreta directly on the soil with Arcadian-like simplicity was confined to a very few. He said that the processes, inorganic and organic, by which effete matters are got rid of by the soil can be but feebly imitated by man. Yet it is by the study of these processes and their more exact imitation that we must look for a more satisfactory disposal of sewage in the future.

The author traced the different methods of excrement disposal from the primitive privy to the introduction of the water-closet in 1810, since which time the latter has become the common, although by no means universal, method of removal, notable exceptions being found in large towns, such as Leeds, Bradford, and Birmingham, in which there were many houses without water-closets, while in Stafford a water-closet was phenomenal.

Directing his observations more particularly to the metropolis, he showed that at the beginning of the present century, and for long afterwards, cesspools were universal in London, and, although sewers existed, it was penal to use them for sewage. At this time the river water at London Bridge was drinkable, and many persons still remember the waterworks opposite Fishmongers' Hall, which were used for the supply of the City. The use of water-closets increased the volume of water in the cesspools, and necessitated an overflow to the sewers, so that in a few years the state of the law underwent a complete reversal, and now, instead of the discharge of sewage into sewers being a punishable offence, it is penal not to drain into a sewer, if one be accessible. The author said that the composition of sewage varied much less than might be expected, and that the difference was one of degree rather than of kind; that there was

little difference between the sewage of a water-closeted town and a non-closeted town. Taking the average of the community, the dry, solid excrement is 1 oz. per head per day, which is distributed through 300 lbs. of water, say 15 grs. per gallon, and as for the urine, whilst the major portion of that of adult males never finds its way direct to the sewers, of the 2½ oz. of solids, distributed through 300 lbs. of water, 1½ oz. only is organic, one-half of which, urea, is speedily converted into innocent carbonate of ammonia. Although the solid excrement forms the most important polluting agent of sewage, it is by no means the greatest in aggregate amount, and, indeed, forms only a small fraction of the total polluting material which comes from the innumerable articles of domestic economy. Speaking of the more immediate subject of his paper, the disposal of sewage, the author referred to the difficulties that had to be encountered in the metropolis, the sewage of which might, for purposes of illustration, be regarded as a typical sewage. He thought that in no British town could the difficulties be greater than those which presented themselves in London. A site, much of which was below river level, an immense area, a city remote from the sea, with no available area close to its boundaries, and a situation near the upper end of the tidal reaches. He considered that a very large amount of credit was due to those who had hitherto dealt with the disposal of the sewage of London, and shame be to those concerned now, who, if after being unwillingly convinced, or if not convinced, convicted of neglecting to do all that is possible, do not at once manfully set themselves to do all that can be done to mitigate and abate the nuisance of the Thames, a river which has so lately raised its filthy stench in cry to heaven for a remedy. He pointed out how prone sewage was to putrefaction, and how by the mutual interchange of the decomposing organic matters and some of the mineral constituents of water—viz., sulphates—that sulphuretted hydrogen gas was generated, that sewage contained not only organic but organised bodies, and these in such a state of unstable equilibrium that their molecules readily rearranged themselves under the agency of external influences, and always to form simpler bodies; the tendency being to revert to those simple chemical compounds which serve as pabulum for the support of the higher forms of plant life. These agents, the bacteria, are the connecting link between the animal and the vegetable kingdom, the apex of the V, one link of which is crowned by the lordly tree, the other by man, the lord and master of the earth.

When fresh and freely exposed to air, as in sewers only partially filled, sewage has little odour, and can scarcely be considered as offensive; but, once let it accumulate in large quantities and come to comparative rest, putrefaction sets in, and it becomes vilely odorous; a seething mass full of those minute organisms which live and grow and multiply in an airless—a deoxygenated—medium. To prevent this, sewage must be dealt with in one of three ways:—1. The sewage may be at once thrown into a large volume of water—a river or the sea—where it can be carried away by currents, diluted by diffusion, and oxygenated by the dissolved oxygen, without appreciable nuisance; 2. It may be applied directly to land if sufficient area can be obtained to dispose of the sewage without offence; 3. It may be treated with chemical agents, such as either destroy the organic matter, or those that destroy the agents of putrefaction—the lower organisms. The author briefly discussed the first method, but only to condemn it as causing nuisance and danger to health.

In speaking of the second method, utilisation on land, he said that while in principle this was no doubt the right one, the fertility of the land being dependent on the restoration to it of the mineral constituents of the food grown upon it, the method from a pecuniary point of view could rarely be profitable and commonly entailed loss. He estimated the value of a ton of London sewage (the quantity yielded per head of population per week), if its manurial constituents were in a solid and portable form, at two-

pence; but when sewage had to be utilised on land in a highly diluted form and in all weathers, the actual value was found to be only a halfpenny, and this leaves no margin for cost of transport, so that, when sewage had to be pumped, the cost of pumping exceeded the value of the article pumped.

There was, however, no agent which so effectually deodorises sewage as the soil, which acts not only as a checker of putrefaction, but also absorbs the gases of sewage, and further is the nidus of the well-nigh demonstrated nitrifying agent—*i.e.* the bacterial organism by which ammonia and nitrogenous organic matter immediately, or through the immediate stage of ammonia, are converted into nitrates. The author referred to the researches of Scloesing and Müntz, and of Warington, to show that it is probable that such a bacteria does exist and plays some such part in nitrification as yeast in a saccharine infusion does, in setting up alcoholic fermentation. A point of great practical importance referred to in this connection was that the nitrifying action is limited to the superficial layers of soil, decreasing as we descend, until at eighteen inches below the surface the action entirely ceases. This points to the possibility of economy in the cost of carrying out the process of intermittent downward filtration, as by keeping the superficial layer of the soil in good condition for nitrification, the great expense of deep excavation and preparation of the soil may be saved.

While broad irrigation, where a sufficiency of land is available, offers a satisfactory mode of sewage disposal, and is one which holds out more likelihood of realising some portion of the value of sewage than any other, it is seldom applicable to the sewage of large towns, on account of the difficulty of procuring a sufficiency of suitable land, porous, undulating, and at such levels as obviate expensive pumping.

There was a vulgar but erroneous notion prevalent that sewage can be effectually treated by means of chemical substances alone. Any chemical which effectually destroys the spores of bacteria, or deprives them of potential life, will certainly render the sewage unfit to be disposed of anywhere, for by such addition it becomes a poisonous fluid.

Chemical treatment, directed to the end of clarifying sewage, but not of rendering it non-putrescent, was a great advantage; for the suspended solids of sewage are the chief source of difficulty in treating sewage. As to the agents to be used for clarification, the author said if sewage is to be used for broad irrigation, simple straining will suffice. When land filtration is the plan to be adopted, something more is advisable, and where the effluent is to be turned into a stream without any other treatment than a chemical one, efficient clarification is indispensable—such a clarification as leaves less than a grain of suspended solids in each gallon of effluent—and even with this degree of efficiency no effluent ought to be turned into a stream unless the volume of running water is enormous in proportion to the sewage it is to receive.

The chemicals to be used for precipitating sewage may be varied. Of these lime has been largely used, both on account of its being reasonably effluent, but also on account of its cheapness. Skill is needed in the use of lime; it should be dissolved previous to its use, it being four times as efficient in this state as when used as milk of lime. Fifteen grains of lime to each gallon of sewage is an ordinary proper proportion, but it is better to accurately *adjust* the quantity to the degree of hardness of the water of the district, and it should not exceed this:—*i.e.* one grain of lime per gallon of sewage for each degree of hardness of the water supply. No appreciable excess of free lime will then be left in the effluent. An excess of lime is hurtful, for subsequent putrefaction is apt to occur; it may kill fish, and according to Warington may entirely prevent nitrification. The addition of a little sulphate of alumina is beneficial, as it carries down a flocculent precipitate entangling the lower organisms and their spores, difficult to remove by lime alone. Moreover, the use of alum

neutralises any excess of lime which might occur in the effluent. Sulphate of iron is another salt which may be employed, but it was questionable whether this was a useful addition when sewage is subsequently applied to the land.

The author concluded his paper with the following remarks:—So far as I can foresee, the sewage disposal of the future for our large towns will be one whose application to land supplements a preliminary precipitation process, and the land treatment will be a filtration process by which the area of land requisite will be limited. Such a combined process fulfils all the requisites of good purification, and is based upon these fundamental data. The sewage must be dealt with speedily before putrefaction has begun, and the agents of putrefaction, the bacteria, must be removed by clarification, which secures the removal of most of the bacterial organisms. The precipitated and clarified sewage is then to be brought as speedily as possible under oxidising influences, and nothing more effectively does this than the nitrifying organism. Putrefaction and nitrification are antagonistic processes, and so long as nitrification is going on putrefaction is, I believe, impossible. Sewage, when clarified by any simple process—and the simpler perhaps the better—and then passed through land, is odourless, and this cannot, strictly speaking, be said of sewage simply precipitated, and it is then also insusceptible of putrefaction.

Anything that falls short of the results obtained by the combined process I have referred to cannot be considered a very desirable mode of sewage disposal, albeit a less efficient process may, under certain circumstances, be permissible.

The President, in moving a cordial vote of thanks to Dr. Stevenson, said that they would all be sorry to hear of the author's indisposition, which prevented his attendance that evening. The subject was one of great importance, and he hoped an instructive discussion would follow.

DISCUSSION.

Dr. Edmunds did not consider the sludge valueless, as at Aylesbury he was informed that it sold for 3*l.* 10*s.* 1*d.* per ton. The result of the Aylesbury process was to produce a beautiful colourless liquid. He thought a precipitating process acted better than Dr. Stevenson gave it credit for. At Aylesbury no lime was used, and the effluent had an acid reaction. The materials used were alum, blood clay, and charcoal. He spoke of a visit he had paid to the Berlin Sewage Farm, where the soil was light and permeable.

Dr. Drysdale said they were all chemists enough to know that the nitrogen in their food had been stored up for long years, and afterwards was discharged into the ocean by the present method of the metropolitan sewage disposal; that was an important problem for the human race. If they sterilised Canada and America, they would in the long run find themselves not getting food. They had a great quantity of nitrogen sent to them, and it was now proposed to take it to the seas to increase the fisheries. If that was all they could do, the resources of science were not very great. The sewage farms of Paris produced an effluent that was actually drinkable, and what was to prevent that being done in respect of London. Professor De Chaumont had stated that there was quite enough land on the northern shores of the Thames for the purpose, and he believed that they would be obliged to dispose of the whole of the sewage by passing it through the land.

Dr. Bernays said there was nothing more barbarous than the present treatment of London sewage. He believed in the treatment of sewage on land. Some very absurd experiments had been made upon land which was not suitable and under impossible conditions. The method adopted at Birmingham was an admirable one—a combination of precipitation and filtration through land—the result being a very pure effluent. What was wanted for land filtration was a sandy loam, and there was plenty of it at the mouth of the Thames. His remarks as to soil would apply to cemeteries; in a stiff soil the body did

y for many years, but in a porous soil it was and completely oxidised. He had known very applications of lime, and agreed with the author per as to the importance of applying it, in solution in a limited quantity. In a solid form a large lime facilitated nitrification but not in solution. Rogers Field thought that the extravagant notions of value of sewage had done much to hinder a disposal of sewage. There had been all sorts of forms to utilise sewage, but none of them had been successful. He was aware that the proprietors of the process said they got 3*l.* 10*s.* per ton for the sewage manufactured from sewage, but there was a redundancy about this amongst competent judges. A constant component of sewage he thought had been dissolved—viz., paper; there was an enormous quantity used in water-closets, and this, when dissolved, of the causes of the slimy nature of the sewage, which was such an intractable and difficult one to deal with. One remark in Dr. Stevenson's report might easily be misunderstood, and lead to a practice—viz., that the researches of Warrington pointed to a great economy in the preparation of intermittent downward filtration by employing a depth of land than had hitherto been deemed necessary. As to nitrification, he was not able to give an answer; but, looking at the question practically, the depth of three feet was not sufficient to prevent sewage passing directly to the land drains in an unconditioned state. The drains ought to be five or six

feet in exceptional cases when it was necessary to reach the subsoil, an economy might no doubt be made, although the drains should still be five or six feet deep. In ordinary cases, however, where the preparation and deep drainage were the chief expense, he did not see how the economy was effected. Dr. Frankland had stated in the report of the Royal Commission that the sewage of Kendal could be disposed of on an acre of suitable land; this had been very much questioned. It was a positive fact that a result almost equal had been obtained at Kendal ten years ago, and as he himself carefully investigated the details, the society was able to know them. The population of Kendal at that time was 13,700, and the average quantity of sewage was only about half the strength of London sewage) at 1,000,000 gallons a day. The net quantity of which the sewage was applied was only 4 acres, and 25 perches, giving 2,942 people per acre. The sewage of Kendal was disposed of, on a small quantity of land for upwards of three years, more land was used. Before this was done he had seen the influence of the sewage had affected the soil below a depth of about 6 inches. The sewage was of a very fine, free character, and the sewage was well clarified. The growing crops were very good, and considerable returns were yielded. The sludge deposited in tanks and mixed with ashes, or dug and used. That was easy at Kendal, but in the case of a large town, with four millions of inhabitants, it would be a question. As to the filter-presses, he had been asked at these being brought up now as something new, in fact, they were to his knowledge in use at thirty years ago. The sewage was there treated, and the result was satisfactory so long as the sewage was applied in proper quantities—one ton per million or 15½ grains per gallon. The filter-presses, did not pay, as they only added to the cost of the sewage without improving the sale.

Mr. Blyth said that if the author of the paper at present he would have criticised one point,

where he doubted whether sulphate of iron was of any manurial advantage. He must have overlooked a very good paper read at the Chemical Society by Dr. Griffiths, of Manchester, on sulphate of iron as a manure. The paper of Dr. Stevenson was a very hopeful one, and had impressed him with the importance of the researches upon nitrification.

Mr. Corner was not satisfied that Dr. Stevenson's suggestions could be practically applied to the metropolis. The soil must be of a proper description, and there must be other advantages to carry out the system.

Dr. Edmunds spoke of the unsatisfactory results at Wimbledon, where the authorities had been proceeded against for creating a nuisance, and considered that these were due to the land not having been properly prepared, and to its having to receive sewage in all seasons.

Mr. Jacob, as representing an extra metropolitan district, in which there were several small towns, saw a difficulty in the treatment of the sewage over the land for the reason that in one portion of the district the land was open and porous, and in another portion it was not so. He wished to know what was the best process where there was a stiff soil at the lower end of a district. Local bodies looked to their medical officers, their chemists, and their engineers for advice on the subject, but there was still a very great haziness over the question.

It was here suggested, in answer to Mr. Jacob, that if there was a suitable soil at the upper end of the district, the sewage from the lower end could be pumped up, as had been done in other cases.

Dr. C. E. Saunders said that, in his opinion, the solution of the sewage-treatment difficulty had been much obscured by the question of cost, and it was not fair to make science responsible for a failure, which was largely one of pounds, shillings, and pence. If sanitary authorities would carry out the scheme best adapted for their respective districts, and one of the best was that advocated by the author of the paper, there would be little difficulty in obtaining a satisfactory effluent. He thought he could answer the question of Mr. Jacob as to whether collecting sewage in tanks without chemical treatment, and then passing it through land, would suffice. It would certainly not; for sewage stagnating in tanks, intensified the rankness of sewage, and the effluent from the tanks was more offensive than the incoming sewage. For land treatment, the fresher the sewage was taken on to the land the better. There was no need to go to a patented process like the A B C system, and he always advised its non-adoption.

Mr. Rogers Field, in response to a request of the President, said with reference to Mr. Jacob's remarks, that it was impossible to advise as to particular localities, and each case must necessarily be dealt with itself when upon the ground. As to the advisability of having a chemical process applied before putting the sewage on the land, that would vary with circumstances. He did not think it was necessary in the case of small populations. He agreed with Dr. Saunders that it was a mistake to retain sewage in tanks unless a chemical process was applied.

In answer to a question, he said that evidence had been given that there was a sufficiency of land of the required quality for sewage disposal in the valley of the Thames.

The meeting then adjourned.

THE INTERNATIONAL INVENTIONS EXHIBITION, 1885.

THE first question which naturally suggests itself with regard to this, the third of the series of Exhibitions inaugurated by H.R.H. the Prince of Wales in 1883, is—In what respect does it differ from the preceding ones in structural arrangement, scope, and classification?

First of all, then, with regard to arrangement, the Inventions Exhibition, or, as it has already been popularly christened, the 'Inventories,' shows a striking re-adjustment of the space occupied by the former Exhibitions—

the 'Fisheries' and the 'Healtheries'—by which the ground enclosed has been rendered capable of affording greater room for exhibits, and at the same time has been simplified in its general plan by the enlargement or absorption of many of the previous smaller courts and galleries and by the removal of isolated buildings. Let us take, for instance, the main gallery, which faces the visitor as he stands on the steps after entering from the Exhibition Road and passing through the vestibule. It will be observed that by simply removing the walls of what were last year the dining-rooms on the one side and a series of small annexes and separate buildings on the other, a magnificent open space, consisting of three parallel galleries, has been obtained. The rest of the building remains more or less as it was, with the exception of the east and west sides; and here, again, we find considerable alteration and improvement, either by the absorption of narrow dividing walks or by the opening out of annexes formerly separate. Thus, in the west gallery, where machinery in motion was exhibited last year, as it is this, we find courts on either side in place of partitions by which spaciousness, effect, and improved access have resulted. On the eastern side a middle court has been erected over the path that formerly led up to the gardens which connects the east gallery with the east arcade, the three forming one large court. Although a considerable amount of ground has been enclosed by these additions and alterations, it is pleasant to discover that the upper gardens have not only not been trenched upon, but that actually more outdoor space has been provided for the public. The beautiful grass-plot with its flower-beds in front of the clock-tower and electric mast light, which was formerly square, has been made semi-circular, gaining thereby in beauty and affording a far greater space for the walks approaching and around the large pond in which the illuminated fountains play.

Another open space which has been converted into an exceedingly pretty garden lies to the north of the main gallery, between what was last year the water pavilion, and which is now the Austrian Court and the printing office of Messrs. Clowes. Along one side of these are large coffee rooms of tasteful design, and the terrace above this garden has been left quite clear of buildings. Returning again to the upper gardens, to where the Indian and Ceylon tea and coffee-houses stood last year, we find a really admirable alteration. A series of kiosks, five in number, have been erected between the trees that stand at the back and close to the West Gallery, and in these tea, coffee, and ices will be served. In front of them is a broad gravelled walk, and from this point the best view of the grounds and illuminations can be obtained. We have only to remember how this site was cut up by buildings and machinery last year, to say nothing of its being used as a road by which coal and the various material for the machinery gallery were brought in, to realise the change for the better. To sum up, we may say that the re-arrangement of the buildings and gardens and open spaces has been based on simplicity, which is the fundamental principle of invention.

We now come to the scope of the Exhibition, and we cannot do better than quote the words of H.R.H. the Prince of Wales at the closing ceremony of the Fisheries Exhibition, when he said of the present one that it was designed to show the progress of invention, especially to labour-saving machinery, since 1862—that is to say, since the last great International Exhibition held in this country. As the scheme of the Inventions came to be more fully considered, it was determined to include music, and this division was to embrace not only modern instruments, but a loan collection of appliances, pictures, and instruments of any date not earlier than the beginning of the present century. Considerable difficulties presented themselves at the outset with reference to the scope of the Exhibition, since it was no easy matter to define what was included under the term 'invention.' Ultimately the council decided to be bound by the limitations of the patent law. It was found, however, that even these did not afford

sufficient restriction, so great has been the progress of science and art. There was only a certain amount of space at command, and experience showed that to accommodate even those who applied to exhibit their inventions would have required five times as much space. It was, therefore, determined to be very chary of admitting inventions of the nature of those shown in the Smoke Abatement Exhibition of 1881, in the Fisheries Exhibition of 1883, or in the Health Exhibition of 1884; and to these were added such inventions as had been shown at the annual exhibition of the Royal Agricultural Society.

We next come to the classification, which includes thirty-one groups exclusive of music. These groups are further subdivided into one hundred and sixty-five classes.

Much more might be said with regard to the admirable arrangements for the refreshment of all classes, for the general amusement of the public in the way of music and fountains, and especially with regard to the increased facilities of traffic. The most striking addition to the last-mentioned subject is the construction of the subway, nearly a quarter of a mile in length, from the South Kensington Station into the Exhibition. But on these matters we are content to leave the public to judge for themselves. We can, however, assure them from personal inspection that they will find no mere repetition of former exhibitions, but an entirely novel arrangement in every respect of inventions that are bewildering in their variety and extent. At one end of the Exhibition air and electric engines will be seen in full work, whilst at the other soft music and sylvan surroundings are there for those to whom the whirl and noise of machinery is distasteful. Even the frequenters of the Healtheries will for some time be at fault, so utterly different is this Exhibition from any that has preceded it. In conclusion, we can say with much satisfaction that the first care of the Executive Council has been to thoroughly examine and improve where possible the drainage of every part of the grounds and buildings. Mr. Bennison has wisely completed what was partially done at the Health Exhibition, in applying the Banner system to the whole of the drainage of the Exhibition, by carrying up ventilating shafts from all the principal drains, and fitting the same with 'Banner' extracting ventilators and 'Banner' down-draught ventilators as required, to obtain the most perfect results. These ventilators have also been used for the ventilation of the staff rooms.

Owing to the state of unpreparedness of the exhibits, it is not proposed to attempt a detailed description of many of them in this issue of the SANITARY RECORD.

HEATING APPLIANCES.

The Eastern Gallery is mainly devoted to electrical apparatus and appliances, a large proportion of them for lighting purposes, other illuminants composed of gas appliances, oil lamps, &c., and a few cooking and heating stoves.

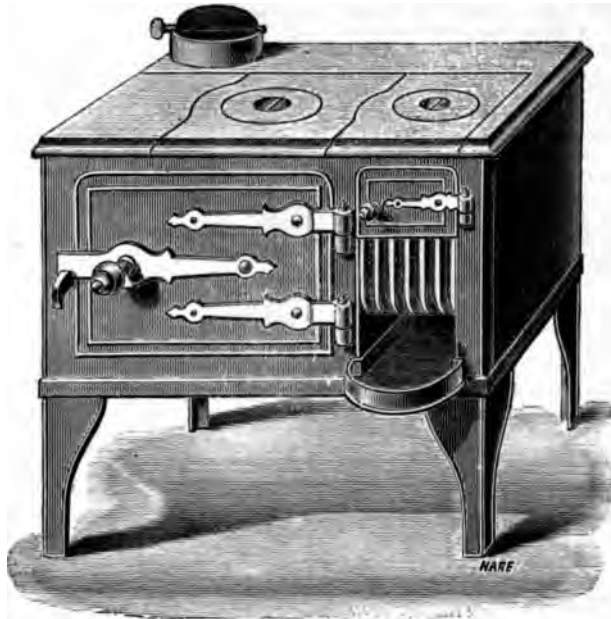
Messrs. Steel & Garland, Holborn Viaduct, exhibit their Wharnccliffe Grates in a few different patterns, the central figure in the display being a Wharnccliffe with an entire brass front, wood mantel and over-mantel, and complete suite of fireplace appendages; but there is nothing new in principle in the exhibit as it now stands.

The Wilson Engineering Company, High Holborn, are close to the last-named with one of their Prize Medal Kitcheners, the small allotment of space only enabling one of these excellent kitcheners to be shown.

Mr. Thomas Fletcher, of Warrington, through his London agents, Messrs. Deane & Co., London Bridge, has a general collection of his gas-heating and cooking apparatus on view. The incandescent gas-fires exhibited are notable, and the increased size of the fronts and the introduction of tiles give additional importance to them. One of the newest additions to Mr. Fletcher's appliances is a small instantaneous water-heater, intended to be fixed over the basin in a lavatory, capable of delivering hot water at the rate of one quart per minute. It is compact, and can be arranged to supply the gas or deliver water at either end of the apparatus, as desired.

rs. Brown & Green, Finsbury Pavement, and Beds, the Gold Medallists at the Smoke Abatement Exhibition, are in close proximity, with but a mere of space, and, in looking at the little 'Gem' Cook-stove, awarded a Gold Medal at the Health Exhibition, many persons may be inclined to ask what as in such an unpretending little apparatus to cause tain such a distinguished award. Our illustration similes of the one to which the medal was awarded. ade in a variety of sizes, from 16½ inches wide s, and, it will be observed, is complete in itself, g no setting. It is admirably adapted for the use

merely a pipe to carry the smoke to the chimney. It has fire-brick back and sides, a wide open fire, very shallow from back to front, by which a joint may be roasted, and the top can be utilised for boiling or stewing, and for heating irons. A new large cylindrical stove, adapted for church heating, is also shown, and, for its size, is perhaps the cheapest to be obtained. It has a strong fire-brick lining, a feeding-door, another on a level with the bottom of the grate for removing clinkers, and a lower one for clearing out the refuse, and a valve to regulate the heat. This stove will burn from twenty-four to forty-eight hours, according to the rate at which it is allowed to



cottager or artisan, being of a most economical er, cooking admirably, and presenting the largest r boiling and frying possible to obtain for its size. ode of heating the oven in the Gem ranges is differ- that generally employ-d. Instead of having a flue and it for the heat and smoke from the fire to pass h, it is, so to speak, jacketed with a hot-air er, to which the heat is imparted by conductivity, y so dispensing with flues, the trouble of cleaning is

work, and it may safely be left alight the entire winter, whenever a uniform and constant heat is required.

Messrs. Stott & Co., Fleet Street, and Oldham, show a collection of their patent gas governors, which have often been mentioned in the SANITARY RECORD in connection with the great saving of gas effected by their use. One of the most recent testimonials received by the firm is from the lessee of the Cirques at Glasgow and Liverpool, in which a tabulated statement is given of the saving of gas effected in both the establishments in a given time after the Stott governor had been fixed. There is no doubt that Mr. Stott's gas governor is a valuable invention—not only as regards its economy to gas consumers who adopt it, but in the regulation of undue pressure at the burners, to the comfort of the occupants of a room in which gas is burned.

Another gas governor, called The Safety, is shown by Messrs. Carter & Lees, of the same town (Oldham). It differs from that of Messrs. Stott & Co. mainly in one point, and that is in the addition of a metal weight of quadrant shape, fixed in connection with the float in a vertical position, the narrow end of the segment pointing downwards. This is called an automatic weightier, or compensator, the idea being that an alternative pressure is necessary, as the float that rests in the mercury rises or falls, or as the pressure of gas, or the requirements for its use become greater or less. Hitherto, after the fixing of a governor, and the regulation of the lights has been effected, it has been left to its own otherwise unaided action, and it is contended that this pressure is unequal, acting in an inverse ratio, whereas the compensating balance which moves backwards and forwards with the rise and fall of the float, adds to or



d. In the tests at the Health Exhibition, a leg of weighing nine pounds was well cooked with an six pounds of coke and one pound of wood, ng lighting the fire and heating up the oven, he Gem may fairly be called the poor man's *par excellence*. A very useful stove, suitable for a room or a variety of uses, is the 'Radiant,' as illus-

It will be observed that it requires no setting, but

decreases the weight on the float, according to the number of lights in use and the consequent quantity of gas required to pass through the governor. The idea is ingenious, but practical tests are required before it can be pronounced as much superior to the ordinary system.

ELECTRIC LIGHTING AND APPLIANCES.

Messrs. Sellars & Co., Canning Street, Birkenhead, show a cheap and ingenious mode of laying electric wires underground, which it is claimed can be carried out for quantities nearly as cheap as overhead wires, with the advantage of preventing danger from the snapping of wires, or to the men engaged in fixing them. The mode of procedure is to cut a trench under the street or pavement, lined with a thin wood casing, into which the wires are laid in the form of a belt or cable, viz., a number of wires are laid in a parallel line interwoven with a specially made cloth insulated with a bitumen compound. A concrete cover is placed over this, and the earth is then filled in and the street repaved. The concrete cover is made so that it can be easily removed, and the cables exchanged or increased in number. By this plan two or more belt cables can be laid over each other, a division between each being formed by means of slabs of tarred or creasoted wood, with narrow slips of similar wood laid between the cables at the edges, the whole being nailed or screwed together. It is also suggested by the patentees that to save the cost of laying underground, belt cables may be cased with tarpaulin, painted canvas, Willesden paper, or even thin sheet metal or wood, and fixed along the face of buildings, in side streets, or in country districts under the eaves of cottages. It is likewise suggested that local companies may be formed, or corporate bodies, or local boards may acquire the sole right to use this patent exclusively in their districts. The invention appears to be one worthy of consideration, as with the constant addition that is being made to telephone and telegraph wires, the increase of overhead wires will have to be stopped. The firm also exhibit a solution for damp walls, which, being of the colour of water, does not stain carved work.

Messrs. Harrison, Cox-Walker, & Co., Darlington, exhibit a small incandescent electric lamp for examinations of the mouth, throat, teeth, &c. It is very nicely got up, fitted with an ebonite handle and silver-plated clip and switch, and is illuminated by four large Leclanché cells of special construction. It can also be adapted for a temporary night light, six small cells giving a $2\frac{1}{2}$ candle-power light for about twenty minutes, and can be illuminated or turned off at a moment's notice. This will be found a very useful apparatus either for professional or domestic uses. The firm are also making a special feature of small electric motors for temporary purposes. They are arranged to screw against a wall or to stand firmly upon a table or bracket, and are intended for mechanical or other purposes where light is only required for short spaces of time. If exhausted by too continuous use they will recover power if unused for a short time, and may be looked upon as most serviceable articles. Fire alarms in connection with electricity are also shown. These consist in actuating the electric current by the rise in temperature of a strip of white metal, a mode of action that has already been mentioned in the SANITARY RECORD.

THE ANTWERP EXHIBITION.

(FROM OUR OWN CORRESPONDENT.)

ANTWERP this year plays the host to all the world of Art and Industry willing to come and show itself in the great Exhibition building the city has erected on a large site near the landing-place of the English steamers which place Antwerp and Harwich in daily communication. But in this new Exhibition life the great cities of the nine-

teenth century are leading, as in private intercourse of old, when the world—or anything little that thinks itself large enough to form any considerable part of the world—issues its invitation to 'Come and show what you have,' it implies 'Come and see what I have.' Hence it happens that every International Exhibition consists mainly of exhibits of the products of the country in which it is held. Another circumstance that has more of late contributed to this result is the growing conviction among manufacturers, especially those of England, that exhibiting their goods at exhibitions abroad is only to teach Continental manufacturers how to make them, and as they can be made at first hand more cheaply on the Continent than in Great Britain, the British competitor cannot compete abroad, and so stays at home. Though there is another view of the subject, English makers are more and more losing faith in it, and, as many English manufacturers know to their cost how ingenious the Belgians are in copying and applying to their own use the mechanical skill and patented products of other lands, it comes that Belgium has the greater part of the International Exhibition at Antwerp all to itself, and English requirements are accommodated in a very small space. The contrast between the two is especially striking in the two great industries of both nations—iron making and machinery. England has no representative or representation worthy of distinct mention in these matters at Antwerp, while the great Belgian iron and machinery-making firms show more largely than ever. The great house of Cockerell & Co. has exhibits on a scale which it is computed will cost them 150,000 francs to make them. And the works are, comparatively speaking, next door to the Exhibition building. What would it have cost any English manufacturer, then, to have made such a show? The Germans and the French, who have easy access, are making exhibits on a scale which show how much such Belgian firms as Cockerell & Co. have to compete with in iron and machine trade upon the Continent.

But in writing, even thus vaguely and generally, of the exhibits at Antwerp, I write more by faith than by sight, for though the Exhibition was formally opened on the 2nd inst., and I have deferred writing this until the last moment that the printing requirements of the SANITARY RECORD will permit, the larger part of the exhibits is yet unseen, and very few indeed of the exhibitors have yet concluded all their arrangements. Yet I do not speak without book, for, strange to say, the catalogues, which at most Continental exhibitions are the last things to make their appearance, were at Antwerp the first. Perhaps after all this was to be looked for there, where the first most celebrated printer in the world—Pantin—flourished: where his labours are so much appreciated that the local authorities have bought the house, the printing-office, and all its presses, types, &c., and converted it into a museum, which is unique in its character and historic worth, and marvellously interesting, especially to an Englishman, for there Tyndal's first full and comprehensive translation of the Bible into English was printed. One need not go to Antwerp to compare what was then printed by the Flemings and what is now spoken in England to learn how much the English language has changed since then. Of course the Flemings are not responsible for the different forms the types take in English printed Bibles in these days from that they put on in the edition that Pantin printed of the first English Bible; but the Flemings are responsible for the changes our mother tongue has suffered at the hands of the printers who have put it into the type of the catalogue of the English section of the Antwerp Exhibition.

Thus, while it would be all the same to a Belgian ignorant of English, no Englishman on the Continent would think of ordering from John Moir & Son, Limited, of Leadenhall Street, London, anything like 'barries,' 'sams and sellies,' 'jart fruits,' 'devilled meats,' 'jenned fowls,' 'jomatoes,' 'paches,' 'jamarinds,' and 'couds and milk.' Fancy an enterprising Belgian writer anxious

the English names for things edible and of general demand, looking into a dictionary for its! Here I may give a list of English exhibitors appertaining to food and health and

Robinson & Co., Rawmarsh, Rotherham, Yorkshire.—Original spiced vinegar.

G. Soutter & Co., St. Mary Axe, London.—Paints, and sanitary appliances.

Queensland Meat Export Company, Fenchurch Street, London.—Preserved meats.

West & Son, Sheffield.—Furniture and other appliances.

Watt, Liverpool.—Scotch whisky and British

Co., London.—Mineral and aerated waters.

Gibbs, Mill Street, Liverpool.—Heating and gas apparatus.

Anderson, Erith Iron Works.—Patent purifier, as used by the Antwerp Waterworks purifying water from the river Nethe for the town of Antwerp, duplex pumps, and hydrants.

W. Smith & Stevens, Battersea.—Patent door

Line-Throwing Sun Company, Dundee.—Ship-signalling and throwing lines for saving life.

Wray Braidwood, M.D., Birkenhead.—Designs for ships.

Smith & Sons, Stockport.—India pale and ales, and Imperial stout.

Bermondsey.—Ship-biscuits, and food medicinal appliances for dogs, game, poultry, and other

Manure Company, Fenchurch Street.—Artificial and chemical manures.

British Syphon Manufacturing Company, London.—Siphons and seltzogenes for aerated waters.

Walcot, Sheffield.—New inventions of household

W. & Harrison, London.—Ship, dog, and other toys and poultry food.

W. Meyers, Hull and York.—Cattle and poultry pig powders.

W. Bradford & Co., London and Manchester.—Mashing machines, and machines for dairies.

W. & Co., Gloucestershire.—Ale and beer.

W. & Smith, Norwich.—Poultry food.

W. & Co., Stratford.—Ale and beer finings.

W. & H. O. Wills, Bristol.—Tobaccos.

W. & Co., London.—Extract of malt.

W. & Co., Houndsditch.—Preserved Meats.

W. & Co., Kennington.—Decorated tables.

W. & Co., London.—Filters.

W. & Co., Dublin.—Irish whisky.

W. & Co., Seacombe.—Phosphoric artificial manures.

W. & Co., Manchester.—Life-saving apparatus.

W. & Co., Leeds.—Thus described in the 'Furriers, curriers, leather belt manufacturers, and general will (sic) furnishers.'

W. & Co., Sydney, London.—Improved system of gas-

Clark & Sons, London.—Dog and poultry

W. & Son, London.—Water-closets and lava-

W. & Paget, Keighley.—Washing and wringing

Sanitary Compounds Company, London.—Disinfectants, soap, sheep dip, &c.

W. & Co., London.—Rice and grain deco-ticators.

W. & Bland, London.—Annatto for colouring butter, rennet, &c.

T. Farmer & Co., London.—Artificial fertilisers, and the raw materials used in their manufacture.

Voile & Wortley, London.—Liquorice manufacturers.

F. Selby & Co., Birmingham.—Patent safety and other kinds of axles, coach springs, and general saddlers' ironmongery.

Most of these enumerations speak for themselves and need no further description. Those about which there is something more to say will, ere the next issue of the SANITARY RECORD appears, have been made more patent to my eyes than they are at present; and hundreds of exhibits of other lands will have been telling of matters of interest to my readers.

ARTISANS' DWELLINGS IN DUBLIN.

THE visit of the Prince of Wales and Prince Albert Victor to the slums and to the improved labourers' dwellings in Dublin, as well as the approaching meeting in that city of the Royal Commission on the Housing of the Industrial Classes, has directed considerable attention to the domestic condition of the poorer classes in the metropolis of the sister country.

There is no doubt that within the past decade there has been a considerable improvement in the direction of providing new dwellings for the working classes, the number of families thus accommodated within that period being over 2,000; but much remains to be done by the municipal authority in actively dealing with 'unhealthy areas,' and in preventing the wholesale adaptation of private dwellings to tenement houses without any structural alterations.

The buildings visited by their Royal Highnesses in the Coombe are those erected by the Dublin Artisans' Dwellings Company, Limited, in 1881. The area on which they are built is one of the nine unhealthy areas reported to the Corporation in 1876,* and comprises 4½ acres. It was cleared under the provisions of Sir R. Cross's Act of 1875, at a cost of 24,000*l.*, and was leased to the company at a rent of 200*l.* per annum. This does not seem an encouraging financial result, but when it is considered that the average rates paid by the old buildings were about 60*l.* per annum, and that they now amount to over 600*l.* a year, it will be evident that the ratepayers of Dublin have made a very sound investment, altogether apart from the question of improved health.

The area is laid out in two main thoroughfares, 40 feet in width, intersected by four avenues leading into large squares. In the main thoroughfares are two-storey cottages, letting at from 5*s.* 6*d.* to 7*s.* per week, and in the squares one-storey cottages rented at from 3*s.* 6*d.* to 4*s.* The entire surface of the streets, avenues, and squares is laid down in asphalt. These are in all 100 two-storey, 104 one-storey cottages, and six shops, the erection of which, including all expenses, cost slightly over 26,000*l.*

The two-storey cottages are of two kinds, one (letting at 7*s.* per week) is 15 feet in frontage, 24 feet in depth, and 19 feet high, exclusive of yard: the accommodation consists of living-room and parlour on ground floor, and two bedrooms upstairs; the other (5*s.* 6*d.* per week) is 13 feet 6 inches in frontage, and 19 feet in depth, with one living-room downstairs and two bedrooms above.

The one-storey cottages which are confined to the squares are also 15 feet in frontage, 21 feet in depth, and 10 feet high; they contain a living-room and one or two bedrooms, according to plan.

All the living-rooms in the site are laid down in concrete, and also the sculleries, yards, coal store, and closet.

The front walls of all two-storey cottages are red brick, backed with concrete, and the rear and cross walls are concrete, as are all the walls of the one-storey cottages.

* See report on THE PRESENT SANITARY CONDITION OF DUBLIN, by our Special Correspondent. SANITARY RECORD, Nov. 11 and 18, 1876, pp. 306 and 321.

The closets are on the dry system : they are only large enough to contain one week's refuse, and are regularly emptied from cleansing passages at the rear : they were adopted, after considerable inquiries, from the plan of the closets at Ripleyville, Bradford, where the water-closets at first in use had to be removed ; and work very satisfactorily.

The population in the dwellings at present is 1,020, as compared with 960 before the clearance of the area.

The death-rate over the entire population housed in the company's dwellings was, for the year 1884, at the rate of 18·3 per 1,000, which compares very satisfactorily with that of the city. In comparing the mortality of persons living in improved dwellings with that of an unhealthy city containing those dwellings, allowance must be made on the one hand for the facts that mortality among artisan classes is higher than that of the superior social grades, and that in artisans' dwellings is always to be found an undue proportion of children, and, therefore, of lives at unhealthy ages ; and, on the other hand, consideration should be given to the circumstance that inhabitants of artisans' dwellings are carefully selected from a class who in their turn are entitled from their aspiration for improved dwellings to rank a 'peg' above their fellow-workmen, content with their homes ; and also that there is a large proportion of inhabitants of artisans' dwellings in the healthy age-periods of twenty to forty years.

The Dublin Artisans' Dwellings Company own twenty-three acres in all, and, when their present engagements are completed, will have provided within ten years of their formation cottage accommodation for about 1,050 families, and block buildings for 200.

Their Royal Highnesses, after having visited one of the slums in Golden Lane, drove up to the Coombe, attended by Mr. Francis Knollys, private secretary, and Captain Hammond, R.N., naval aide-de-camp to Lord Spencer. They were received by Mr. Richard Martin, chairman, and Mr. Edward Spencer, secretary to the company, and by them conducted into one of the one-storey cottages in Reginald Square.

Their Royal Highnesses spent about ten minutes in the cottage, inquiring the position and wages, &c., of the tenant's husband, and then examined the yard and closet.

The Prince of Wales was pleased with the concrete walls and expressed a favourable opinion as to their durability : he also approved of the sanitary arrangements, and thought the dry system preferable to water-closets for such dwellings.

On leaving the cottage the Princes were surrounded by a large and enthusiastic crowd, amid the cheers of which their Royal Highnesses drove away.

SANITARY MATTERS IN FRANCE.

(FROM OUR OWN CORRESPONDENT.)

A PREFECTORAL circular, lately issued in Paris, directs that dead bodies are not to be conveyed beyond the limits of the prefecture, unless inclosed in an oaken coffin, of which the planks are 0·m. '027 thick, the iron bands 0·m. '03 wide, and 0·m. '004 thick. If the body has to be removed to a distance exceeding 200 kilomètres (123 miles) the coffin is to be made of lead 0·m. '002 thick. It sometimes happens that when bodies are removed to a distance of 200 kilomètres (123 miles) fluids and gases escape from oaken coffins ; this unseemly sight and overpowering odour have vividly impressed the municipal authorities who have loudly called for a reform. The Préfet of Police, adopting the advice of the Conseil d'Hygiène, has decreed that henceforth dead bodies, removed to a distance of 200 kilomètres, must be placed in a coffin lined with India-rubber or cardboard steeped in tar.

The Préfet of Police has requested the Conseil d'Hygiène to examine the subject of the boat-washhouses on the Seine, and to consider the desirability of dirty linen

being washed in the river. A commission has been named consisting of M. Sax, M. Riche, Baron Larrey de Luynes, M. Lagneau, and M. Jungfleisch to report on the question.

M. Brouardel, Professor of Medical Jurisprudence and Lecturer on Hygiene, has been promoted to the rank of Commander of the *Légion d'Honneur*. Dr. Proust, General Inspector of Health, has been named chevalier of the same order.

M. Bouchardat, the Veteran Professor of Hygiene at the Paris Medical Faculty, has resigned. It is rumoured that Dr. Proust will be his successor.

M. Gérin-Roze and M. Duguet, at a meeting of the *Société Médicale des Hôpitaux*, described three cases of lead-poisoning resulting from handling chemical *braise*. *Braise* is a special kind of charred wood, sold only by bakers ; it is merely the burned wood left in their furnaces when the fires are extinguished. The women attacked by lead-poisoning dried and packed *braise* which had been steeped in lead nitrate. All the workers were perfectly healthy before working in a factory of chemical *braise*, and most of them continued in a good state of health until the workshop, which was a large airy room, on the third floor, was removed to a small ill-ventilated room underground. People who eat meat grilled over fires of *braise* thus prepared are liable to lead-poisoning, also tailors, who use this *braise* for their hollow irons. M. Labbé has observed lead-poisoning produced by eating bread which had been baked over wood painted with lead pigments.

The Préfet of Police has issued the following decree. A special service is to be organised for inspecting houses and apartments let furnished within the limit of the Prefecture of Police ; the territory included in the Prefecture and situated outside the fortifications is divided into four districts. A health inspector of furnished apartments is appointed to each district, and is obliged to visit at least once a year all furnished houses and apartments in his district. All furnished houses recently put on the list must be visited by the health inspector, also all lodgings which pass from the hands of one landlord to another. In the case of infectious disease breaking out in a lodging-house, the health inspector pays a visit of inspection without loss of time, and makes the necessary arrangements to ensure the safety of the public health. In case of illness or forced absence on the part of the visiting inspector he is replaced by a colleague. After each visit a report is sent in to the Préfet of Police. A general report is sent in by every inspector in the month of October.

Le Conseil d'Hygiène et de Salubrité de Paris has raised the question whether in the interest of public health isinglass ought to be used by pastry-cooks in making creams. In France, an article called 'Japanese Pearls' (*Perles Japonaises*), made with isinglass, is sold for making a soup which is highly esteemed. As isinglass is perfectly innocuous, the Conseil decided that it is not necessary to prohibit its use ; nevertheless, when used in the preparation of creams and jams, the public are to be made aware of the nature of the article they buy.

Le Conseil d'Hygiène et de Salubrité Publique of the Seine discussed at a recent meeting a report on the danger of infectious diseases being propagated by work-shops where bedding is purified and the wool recarded. It was decided that such establishments should be included in the second class of unhealthy establishments and not in the third, as at present ; therefore, when the Minister of Commerce has sanctioned this change, the above operations will be carried on in houses where hygienic precautions are more rigorously observed. It is also forbidden to recard the wool of *mattre-ses*, to beat that material or horsehair, in the streets of Paris.

M. Ch. Girard, the principal of the Paris Municipal Laboratory, has sent in his report to the Préfet of Police. It constitutes a handsome volume in quarto, numbering 816 pages. ['Documents sur les Falsifications des Matières Alimentaires et sur les Travaux du Laboratoire Municipal.' Deuxième Rapport. One vol. Paris : G.

isson. 1885.] The chapters on mineral waters, wine, beer, vinegar, milk, contain full information concerning their production; also the different methods of falsification, and the means of discovering them. The same information may be gathered concerning cheese, meat, fat, lard, oils, cereals, bread, macaroni, vermicelli, &c.; flour, cocoa, chocolate, sugar, syrups, tinned meats, and vegetables and fruits. Nearly all hair dyes sold as infensive vegetable preparations contain mineral poisons. Antiseptic milk contains either nitrate of silver, sulphate of copper, lead acetate, or mercuric chloride. Lead carbonate or subnitrate of bismuth are used in rouges and powders; sulphide of arsenic and lead monoxides are found in epilatory pastes and powders. The chemical inspectors of the Municipal Laboratory paid in 1883, 340 visits of inspection to the Paris markets, 22,312 to the restaurants, 2,065 to beer-shops (*brasseries*) and coffee-shops (*cafés*), 1,488 to pork-butchers' shops, 4,574 to baker shops, 7,433 to grocer and fruit shops. Honest tradesmen approve of the Laboratory surveillance, and dishonest tradesmen have somewhat abated their fraudulent practices since it has been instituted. Many of the principal French towns have established municipal laboratories on the model of the Paris Laboratory.

The April number of the *Revue d'Hygiène* has several very interesting articles. One by M. Vallin, in which the author treats of the connection between the use of sewage for agricultural purposes and the incidence of typhoid fever, is of general interest. It appears that the deaths from typhoid fever in the French army have always been much more frequent in the southern garrisons than in the northern. For instance, dividing the corps d'armées into three groups, we find the following proportion of deaths from typhoid fever for every 10,000 soldiers:—

	1866.	1867.	1868.
Northern Garrison	12'30	14'10	19'80
Centre Garrison	17'90	28'10	43'20
Southern Garrison	29'00	29'50	49'60

The figures may differ year by year, but the Northern Garrison has always the greatest immunity from this disease. We are told that M. Brouardel attributed the great mortality in the south to the fact that sewage was there freely used on the fields in proximity to the barracks. M. Vallin roves, as we think satisfactorily, that this assumption of M. Brouardel cannot be supported, and that the comparative healthiness of the northern garrisons must be attributed to other causes, which at present he does not attempt to assify.

Another article consists of the report of MM. Vallin and Hudelo on the question of the propriety of allowing sewage matters to enter sewers when properly constructed and sealed. The Commission de l'Assainissement of Paris, in a sitting of July 5, 1883, adopted a resolution authorising the discharge of sewage matters into suitable sewers. But, arising lest later experience and fuller knowledge of the object might have discredited to some extent their use, M. Vallin and Hudelo, the secretaries of the two sub-commissions, were requested to prepare reports upon the subject.

The reports, which treat the subject from the hygienic and technical points of view respectively, both support the use of proper sewers.

Now that the Commission has, with due deliberation arrived at this opinion, it is to be hoped that they will initiate with as little delay as possible a thorough system of main drainage, and relieve the city from its myriad of cesspits, fixed or movable. There are other well written papers and reviews, which make up altogether a decidedly interesting number.

THE Corporation of Richmond (Yorks) are providing a new cemetery at an estimated cost of about 2,000*l.*; one of the laudable features of the plan is that as a precaution against infection the mortuary is divided from the rest of the chapel by a glass screen.

FOOD THRIFT.

THE cheap and nutritious meal given to the unemployed in Lisson-grove, by Dr. Norman Kerr, having proved a most successful experiment, the committee of the Emmanuel (Maida-hill) branch of the Church of England Temperance Society organised, by desire of Mrs. Tanner, the vicar's wife, a Penny Supper for about 160 poor people living in the vicinity of Edgware-road. The Misses Cameron, of the South Kensington School of Cookery, prepared the haricot stew, which formed the supper, and which was well tasted and apparently much appreciated. After the soup hot coffee and brown rolls were served to each person, free of charge. Dr. Norman Kerr gave an introductory address on behalf of Miss Cameron, and also stated the object of the Society, which was to demonstrate that palatable and nutritious food could be obtained at a very trifling cost. He said it was a common error to suppose that meat was the only or the most nutritious food; here, for instance, was an excellent soup, made from the simplest and least costly ingredients—haricot beans, onions and potatoes, which absolutely contained three times the amount of nutrition of the same quantity of lean meat. People appeared to imagine that if any were sick they needed 'nourishment,' and were ready to force them to eat meat; but invalids were more likely to be injured than benefited by such a course of treatment. Miss Cameron explained how she had made the soup, which contained the three necessary constituents of human food, namely, nitrogen, carbon, and mineral salts. This could be made at a cost of about a penny per head, for four persons—a pint of haricot beans 2½*d.*, ½ lb. onions ½*d.*, 2 lb. potatoes 1*d.*, and seasoning ½*d.* At the termination of the proceedings every one present was offered some of the soup to take home, and received clearly-printed instructions for making it.

SANITARY MATTERS IN AMERICA.

(FROM OUR OWN CORRESPONDENT.)

TENEMENT-HOUSE INSPECTION.

THERE is attached to the Health Department of the City of Chicago a bureau for the inspection of tenement-houses, dwellings, and factories. It is in charge of Chief Inspector W. H. Genung, and, as showing the practical workings of such a department, some of the features as presented in the superintendent's report for the year 1884, just made public, will be mentioned.

There were 28,092 inspections made during the year, and the following information concerning each building is on file in the Health Office.

Date; location; ward. Owner or agent, address; description of the building, storeys, size, material. Number of families in building, rooms, persons, males, females, boys, girls. Is there a store, workshop, or factory on the premises? If so, where? Kind of business; employer. Number of *employés*; males, females, boys, girls. Are there any dark, damp, filthy, or unventilated rooms? Are the water-closet rooms clean and properly ventilated? Description of out-houses and barns, and how used? Is the surface of lot below street-level, and how much? Are the plumbing works in good repair, and well trapped? Are the buildings and yard properly connected with the sewer? Is the cellar well ventilated? Is it clean and dry? What part of the premises need lime-washing? Sanitary condition of space under building, yard, alley, street gutter, corner catch-basins, and vicinity. Number and location of catch-basins, water-closets, and privies, and their sanitary condition. State what nuisances exist. Is the water supply adequate and on each storey? Any violation of ordinance? Action taken by inspector, and remarks.

From the above abstract of an inspector's blank, it may be seen that the sanitary information concerning the tenement-houses is reasonably complete in Chicago. Beside

the 28,092 examinations made under city ordinances, there were 3,240 examinations made under the state law, of buildings in process of construction. The owners or occupants of 1,932 and 483 shops and stores complained of sanitary defects in the plumbing, drainage, or ventilation in such buildings, special examinations being made and the defect corrected.

The employment of children under fifteen years of age for more than eight hours a day is forbidden, and the ordinance pretty generally obeyed.

Improvements of a permanent character were made in 4,229 buildings of all classes, and included such repairs and construction of catch-basins, trapping and ventilating house-drains, sewers, and soil-pipes; ventilating bedrooms, work-rooms, bath and water-closet rooms, supplying light and ventilating shafts, providing adequate water supply, supplying proper traps for plumbing and drainage; guarding dangerous machinery; providing egress from buildings likely to burn, &c.

It is recommended that the law be changed so as to compel all plumbing to be constructed in plain sight. This provision, Mr. Genung believes, would encourage the plumbers to do better work and to use better material; would educate the public to know good plumbing and material when they see it; it would greatly improve the sanitary condition of houses, and make repairs easy to perform, and defects easy to locate.

The following is an instructive summary of what one department, with an entirely inadequate force, can accomplish:—

Factories and workshops examined	8,808
Stores examined	9,162
Miscellaneous places of employment examined	3,848
Total examinations made.....	21,819
Number of males employed	217,335
Number of females employed.....	46,196
Number of boys under 15 years employed in stores..	619
Number of girls under 15 years employed in stores..	346
Total number of persons employed in above places	263,421
Notices served in factories, &c.	421
Tenement-houses examined.....	4,394
Rooms in said houses	42,994
Families in said houses	10,445
Males in said houses	24,815
Females in said houses.....	23,528
Boys under 15 years in said houses	7,755
Girls under 15 years in said houses	7,822
Total number of persons occupying said tenement-houses	48,343
Notices served in above houses	2,670
Special examinations in factories, workshops, &c. ..	483
Notices served for same	346
Special examinations made in habitations	1,932
Notices served for the same	1,541

SANITARY SUPERVISION OF HOTELS.

It has remained for the Sanitary Protective League of New York city to originate an entirely new sanitary movement. It has prepared a Bill, which it will try and get passed by the State Legislature, which provides that in all towns and cities in which there are boards of health, the owners or keepers of all hotels and lodging-houses shall apply to such boards for sanitary certificates, which shall certify to the good sanitary condition of their houses. These certificates shall not be granted to houses which have not freedom from dampness of site or cellar, proper drainage and plumbing, absence of foul and noxious odours, adequate supply of water, direct light in sleeping rooms, and at least 600 cubic feet of air-space for each occupant. Each innkeeper must obtain and display this certificate, as failing to do so subjects him to damages for sickness of occupants during such negligence, and, in case of death, the executors of the deceased have cause for action.

STATE SANITARY SURVEY.

By far the most ambitious piece of sanitary work being accomplished in the States at the present time is the sani-

tary survey of the State of Illinois. Blanks have been provided to every health officer, and he is expected to see that a complete sanitary survey of his locality is made and sent to the secretary before warm weather sets in. The tabulated returns will make an invaluable reference for the study of epidemics.

EMPLOYERS AS LANDLORDS.

MESSRS. CHUBB'S NEW DWELLINGS.

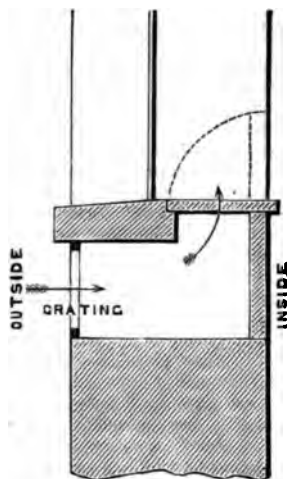
AN illustration of the protective interest which employers are again beginning to show towards their workpeople will be found in the dwellings which have just been completed and opened for the well-known firm of Messrs. Chubb in connection with their works, Glengall-road, Old Kent-road, S.E. The wishes of the workpeople were consulted before the scheme was put into effect, and a committee of the employés will undertake the general details of management, as it is usually admitted that the interested parties generally are the best judges of their own requirements. The buildings, so far as they at present extend, consist, on the ground floor, of a large dining-hall, 60 feet by 28 feet, in which 150 persons can dine, and twice that number can be accommodated when the hall is used for concerts or meetings, a coffee bar, reading-room, kitchen and offices; above are three floors of dwellings, nine rooms on each floor, so arranged as to be let in tenements of one, two, three, or four rooms, without alteration. All room doors open to an external gallery, so that the possibility of foul air passing from room to room is avoided. Access is given to them by a stone staircase open to the air on one side and the balconies or galleries on the front elevation, so that the air cannot be conducted from floor to floor. The floor is flat, of Portland cement concrete on iron joists, serving as the customary drying ground.

Each tenement is provided with a cooking-stove by Barnard & Co., or the Carron Co., cupboard and coal-locker, and each room has two ventilators out of sight, formed in the meeting rails of the sashes. The usual form of dust-shoot, with self-closing door on each floor is also adopted here, receiving the ashes and smaller kinds of refuse, conveying it to the basement, from which it can be removed without entering the building; this shaft is also carried up and ventilated above the roof. A landing is provided on each floor of dwellings, so that the tenants need not be far from their rooms and families when washing. Coppers and sinks are also provided, the waste-pipe of the latter discharging over a grating in the open air. W.C.'s are provided on each landing, and are assigned to the separate tenements, the tenants being furnished with their own keys. Doulton's Lambeth closet has been used with his vacuum waste-preventer, a very efficient and economical combination. The soil-pipes are of iron, and are carried down outside the building into manholes, the upper ends being continued above the roof for ventilation. They are jointed in red lead, and tested by being plugged and filled with water.

The drains are of grey stoneware pipe laid in straight lines, and with regular fall from manhole to manhole, so bend or junction being used. All drain-pipes are jointed in Portland cement, and have been tested by having been filled with water after the lower ends had been plugged with clay. The bottom of the manhole in each case has been formed in cement concrete to the contour of the pipes connected to it. In the last manhole, before the drain reaches the sewer, a glazed stoneware capped syphon-trap has been inserted to shut out foul air from the sewer. The drain is ventilated from end to end by pipes carried above the roof. Doulton's grease-trap has been fixed outside the building to receive the wastes of bar and kitchen sinks.

The water supply is on the constant system, and no water can be drawn except direct from the main. The water for supplying the w.c.'s is stored in a cistern above them, and

is entirely independent of the drinking water. Tylor's 'waste not' tap, which will allow one bucket of water to be drawn and will then close itself, unless turned again, has been used to check waste at the pail services. The ventilation of the hall is effected by large inlet-ventilators placed under each window (see diagram), which admit the air from the outside into a chamber under the window-cill, from whence it can be passed into the room by lifting



Section of Air Inlet at Window Cill.

the window-board which is hinged as a flap (shown by the dotted line). As these cills are high, and the air has an upward tendency, no draught results. A series of outlet ventilators have been formed in the cornice, communicating with special flues, which are carried up in the walls of the building.

The Dining Hall, Coffee Bar, and Reading Room are heated by steam, which is conveyed by wrought-iron pipes round the walls.

All the cooking is by gas, the apparatus being supplied by Mr. Thomas Nock, of Birmingham. The fumes from this gas apparatus are collected in a large iron hood immediately above it, which terminates in flues carried up to the top of the building. This iron hood is covered externally with looking-glass panels in ebonyed wood frames, and forms the show case behind the bar, being furnished with shelves which carry glasses and ornaments.

The flooring of the entire ground storey is composed of Lowe's wood-block paving, and consists of a bed of Portland cement concrete, six metres thick, covered with a layer of asphalt, on which the wood blocks are laid while it is hot. They are thus securely held in their places, damp is prevented from rising, and a warm noiseless wood floor of good appearance is obtained, without any air space below in which dust or objectionable matter can accumulate.

Except in the living rooms and bedrooms, the brick-work has been 'worked fair' and left unplastered; and in the ground storey a pleasant decorative effect has been obtained from the natural colours of the pine ceiling; the red-brick walls and the high Portland cement dado being finished at the top by one course of glazed bricks with a scroll pattern.

The ground-floor water-closets and urinals are easily accessible from the dining hall, but are isolated by an open area, which must be crossed before they can be reached, thus preventing any accumulation of foul air in close proximity to the building. All the staircases are of York stone, and the balconies are formed of wrought iron chequered plates. The ground storey and staircases are lighted by gas, which it has not been considered advisable to bring into any of the living rooms.

Picturesqueness has been considered by fencing in a space of ground in front of the building, and it will be laid out as a garden for the use and enjoyment of the tenants. The work has been designed by Mr. E. Hoole, F.R.I.B.A., who has previously given much study to the practical working of the question in more or less similar shapes; and it is intended, if the present experiment should meet with the success it undoubtedly deserves, to extend the buildings—provision having been made in the plan to enable this to be accomplished when necessary.

BRICK v. STONEWARE SEWERS.

FOR some years past it appears to have been the practice for the Vestry of Paddington to put in large brick sewers in all cases, without regard to the number of houses to be drained. The erection of ten new houses in Manor Place, a short road with only one outlet, and in which not more than thirty houses can be built, recently led the Vestry to resolve to put in its regulation brick sewer of sufficient capacity to drain a town. A tender of 987*l.* was accepted, and this came up for sealing on Tuesday, April 21, Sir Charles Locock, Bart., in the chair. The Rev. Mitchell Cox proposed that the seal of the Vestry be affixed to the contract, whereupon Mr. Mark H. Judge, A.R.I.B.A., proposed the following amendment:—'That inasmuch as there is no evidence that the existing 12-inch pipe sewer in Manor Place is defective, and as a 12-inch sewer is of sufficient capacity to drain more houses than can possibly be erected on the one side of Manor Place which can be built on, this Vestry is of opinion that it would be an unwarrantable expenditure of money to lay any new sewer in this road, and that to put in a brick sewer 3 feet 9 inches by 2 feet 6 inches, as proposed, would not only be a gross waste of public money, but would require, in addition to the cost of the sewer, 987*l.*, a further outlay in the erection of a tall ventilating shaft to prevent the sewer from becoming a nuisance and danger to the neighbourhood, including the new recreation-ground, which has been laid out at so great a cost; it is therefore resolved that before voting on any proposal to fix the seal of the Vestry to the contract for a new sewer in Manor Place, the opinion of a sanitary expert be obtained upon the following points:—

1. Whether the existing 12-inch pipe sewer is of sufficient capacity to drain the existing houses in Manor Place?
2. Whether, if all the land which can be built over in Manor Place should be covered with houses, a larger sewer will become necessary?
3. In the event of a new sewer being considered necessary, should such sewer be a 3 feet 9 inches by 2 feet 6 inches brick sewer, or a glazed stoneware pipe sewer of some smaller capacity?
4. What provision should be made for the ventilation of the sewer recommended? And that it be referred to the Highway Committee to submit these four questions to one of the following authorities, viz., Mr. H. H. Collins, Fellow of the Royal Institute of British Architects; Dr. W. H. Corfield, Professor of Hygiene and Public Health, University College, London; Mr. Rogers Field, Member of the Institution of Civil Engineers; Capt. Douglas Galton, C.B., F.R.S., Chairman of the Council of the Parkes Museum of Hygiene.' This amendment was seconded by Mr. James E. Hill, and on a division was carried by 27 to 17 votes. Mr. Judge received the support of Col. Burchard, C.B., Dr. Bush, Mr. Collins, M.P., Mr. Edmeston, F.R.I.B.A., Mr. Fardell, Mr. Overseer Mills, Rev. R. F. Spencer, LL.D., Dr. Danford Thomas, Dr. Willis, and Dr. Parker Young. Strange to say, the construction of this enormous sewer was supported by an architect, Mr. H. Wilkinson.

THE last quarterly report of the medical officer for the city of Durham states that of the four fatal cases of small-pox that occurred during the thirteen weeks, it was found that none of the victims had been vaccinated.

MUNICIPAL FINANCE.

LOCAL TAXATION.

LOCAL taxation is intrinsically hardly so fascinating a subject for discussion as Members of Parliament appear to find it. It is a question involved and difficult beyond belief; yet there is scarcely a single member who is not ready to talk glibly about it, as though he were complete master of all its intricacies. There is endless variation in the suggestions made for the reform of local taxation, but the practical outcome of them all is the same: that the particular industry in which the suggestor is interested must be relieved. Radicals are at one with Conservatives in holding that the incidence of local taxation is unjust; but while the Conservative looks upon the landowner as the person whose imposts must be decreased, the Radical is eloquent about the burdens of the urban taxpayer. The divergence of opinion upon these points was strikingly brought out in the debate upon the general subject, into which the House of Commons was betrayed on the 5th instant on Sir Massey Lopes' amendment with reference to the expenses of registration. The amendment was to the effect that, as registration is a matter of imperial rather than local concern, the expenses connected therewith should not be imposed upon ratepayers in counties and boroughs, and levied in respect of the occupation of a single description of property. This was aimed at the proposal of the Government to make a temporary advance of 20,000*l.* towards the increased expenses of registration in counties this year, and was only defeated by 2 votes. We are not concerned for the moment with the merits of the proposal, or with the question whether the occasion was a legitimate opportunity for raising anew the whole subject of local taxation. But we may properly insist on the great injustice of the present mode of levying local imposts, and the need which exists for its reform being speedily and closely grappled with. As has been well said, at present honourable members 'throw the whole question of taxation into the crucible at once, without any clearer idea of what is to come out than that they want their own burdens reduced anyhow.' The President of the Local Government Board has more than once given an alluring sketch of the great measure of local government which he has in his despatch box, all ready for production as soon as opportunity serves. In 1881 the Government announced that they were about to consult Parliament on the whole subject of local taxation in a comprehensive manner. In the Queen's Speech of 1882 the House was invited to consider the most equitable form of contribution from imperial rates in relief of local charges; and the Government were only saved from defeat on a motion of Mr. Paget by undertaking to deal with the whole question. In 1883 Mr. Pell urged that no further delay should take place, and the Government had a bare majority of 12 votes. On a subsequent occasion Mr. Pell obtained a majority for a similar motion, and now the Government have barely escaped an adverse vote on a resolution which inferentially raised the whole question again. There is no hope that the matter can be settled this year; but it will obviously be one of the very first subjects to which the new Parliament must set its hand, even if, as suggested by Sir Charles Dilke, a whole session has to be devoted to its solution.

Name of Stock.	Amount of Stock in Circulation.	Interest.	Dates of Interest Payments.	When Redeemable.	Highest and Lowest Prices				Closing Quotation May 11.
					During 1884.		Jan. 1 to May 11, 1885.		
					Highest.	Lowest.	Highest.	Lowest.	
Metropolitan 3½ p.c. Stock ..	16,984,326	P.c.	6th Jan., April, July, Oct.	6th Oct., 1929..	113	104½	108	101	105—106
" 3 p.c. " ..	7,250,000	3½	1st Feb., May, Aug., Nov.	1st Feb., 1941..	103½	96½	100½	94	98—100
Birmingham Corporation Stock	3,445,693	3½	1st Jan., 1st July.....	On or after May 17, 1946..	104½	99½	100½	98½	99½—100½
Blackburn Corp. 4 p.c. Stock ..	330,290	4	1st Jan., 1st July.....	Irredeemable ..	—	—	—	—	110—111
" 3½ p.c. Stock ..	647,900	3½	1st Jan., 1st July.....	Irredeemable ..	98	96	—	—	96½—97½
Bradford Corp. 4 p.c. Stock ..	1,568,437	4	1st April, 1st Oct.	Various.....	—	—	—	—	110—110½
" 4½ p.c. " ..	507,500	4½		Various.....	—	—	—	—	114—115
" 3½ p.c. " ..	272,745	3½		Various.....	—	—	—	—	—
" 3½ p.c. " ..	16,663	3½		Various.....	—	—	—	—	—
Bristol Corp. Debenture Stock	1,209,380	3½	1st May, 1st Nov.	Perpetual.....	101	97½	99½	97	97—98
Croydon Corp. Stock	400,000	3½	5th Jan., 5th July	Within 40 years.	99½	97½	97½	96	96—97
Dundee Corp. Stocks	503,000	3½	15th May, 11th Nov.....	Purchased	—	—	—	—	—
Glasgow Corp. Red. Stock	500,000	3½	15th May, 11th Nov.....	15th May, 1914..	102	99½	99½	98½	97½—98
Huddersfield Corp. Stock	250,000	3½	1st Jan., 1st July.....	1st July, 1934 ..	101½	96½	100	99	99—100
Hull Corp. Stock.....	500,000	3½	1st Jan., 1st July.....	1943	103½	100	—	—	—
Lee Conservancy Deb. Stock ..	196,417	4	1st Jan., 1st July.....	Perpetual.....	112½	108	110½	107½	107½—109½
Leeds Corp. Cons. Deb. Stock	2,389,630	4	1st Jan., 1st July.....	1st July, 1927 ..	102½	98½	100½	99½	99—100
" 3½ p.c. " ..	558,720	3½		Any time on 6 months' notice.	—	—	—	—	—
Leicester Corp. Gas and Water Deb. Stock.....	628,153	4	1st Jan., 1st July.....	31st Dec., 1934..	105½	98½	102	98½	99½—100½
Leicester Redeemable Stock ..	280,553	3½	1st Jan., 1st July.....	1st July, 1932 ..	98½	98½	—	—	99—100
Liverpool Corp. Stock	6,070,000	3½	1st Jan., April, July, Oct..	Irredeemable ..	119½	111½	115	114	113½—114
Longton Corp. Stock.....	100,000	3½	24th June, 24th Dec.	Irredeemable ..	—	—	—	—	100—100½
Manchester Corp. 4 p.c. Stock ..	3,775,735	4	24th June, 24th Dec.	Irredeemable ..	—	—	—	—	—
" 3½ p.c. " ..	91,035	3½	1st Jan., 1st July.....	1st Jan., 1909 ..	—	—	—	—	99—100
Middlesbrough Corp. Red. Deb. Stock	300,000	3½	1st Jan., 1st July.....	1st July, 1916 ..	101	10	100½	100	98½—99½
Newcastle Corp. Stock	450,000	3½	1st Jan., 1st July.....	Irredeemable ..	86½	82½	84½	80½	81—83
Nottingham Corp. Stock	2,000,000	3	1st May, 1st Nov.	Irredeemable ..	—	—	—	—	110—111
Oldham Corp. Deb. Stock	423,049	4	1st Jan., 1st July.....	Irredeemable ..	101	97½	99½	98½	98—100
Portsmouth Corp. Stock.....	400,000	3½	1st Jan., 1st July.....	1st Jan., 1924 ..	101	95½	100½	97½	98—99
Reading Corp. Stock	500,000	3½	1st April, 1st Oct.	Irredeemable ..	—	—	—	—	101—102
Rotherham Corp. Stock	253,188	4	25th March, 29th Sept.	1927	—	—	—	—	99½—100½
Sheffield Corp. Stock	108,150	3½	1st March, 1st Sept.	1914—34.....	—	—	—	—	99½—100½
Swansea Corp. Stock	600,000	3½	1st Jan., 1st July.....	18th July, 1931..	99	94	97½	95½	96½—97
Wigan Corp. Stocks	336,949	Var.	1st Jan., 1st July.....	60 years	—	—	—	—	—
Wolverhampton Corp. Stock..	600,000	3½	1st March, 1st Sept.	1932 and 1942 ..	99	94½	98½	95½	95½—96½

NOTE.—The Stocks marked with an asterisk (*) are transferable in books kept at the Bank of England; those marked with a dagger (†) at other London Banks. The rest are transferable by deed in the usual way, and the Agents are officials of the several Corporations.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

'Something attempted, something done.'

AYLESBURY RURAL.—Dr. Harvey Hilliard's report for 1884 is in every respect satisfactory. He records a distinct improvement in the general aspect of the district, although no works of importance were carried out, the inhabitants in many localities have been more attentive to the purity of their wells and to the disposal of sewage, and removal of offensive accumulations. Moreover, there is a notable decline in the mortality from zymotic diseases, the deaths numbering nine as compared with twenty-seven in 1883 and thirty-seven in the previous year. The general death-rate was also below the average. Forty-seven cases of scarlatina were investigated by Dr. Hilliard, four of which at the beginning of the year proved fatal. The disease threatened to become epidemic at Hitchchurch, where twenty-four cases occurred within a few days, but it was fortunately stamped out by prompt action on the part of the sanitary officials, assisted by the inmates of the infected cottages. An outbreak of diphtheria also occurred at the beginning of the year, the circumstances of which were specially investigated. Five cases of typhoid fever were heard of during the year, none of which proved fatal, and neither measles nor small-pox contributed to the death-roll. The district, however, was ravaged on two occasions by this last-named disease, which was imported from London. The immediate performance of re-vaccination, together with prompt isolation and disinfection, prevented any spread of the infection, and Dr. Hilliard regrets that the public cannot be persuaded that the universal adoption of vaccination and re-vaccination would soon completely relegate this fatal and foul disease to the archives of the past, to keep company with the plagues, spotted fevers, and black deaths 'of the good old times' before sanitation was so much thought of.

BARNSTAPLE.—Mr. Henry Jackson, the new health officer for the borough of Barnstaple, appears to have entered vigorously into the sanitary work of his district. His report for the last nine months of 1884 (the period since his appointment as medical officer of health) shows a district to have been generally fairly healthy, the death-rate from all causes for that period being 19.4 per 1,000 (including a 'zymotic' death-rate of .82 per 1,000) among a population of 12,493. The principal sanitary defect, which was brought out in connection with some of the enteric fever cases that occurred, seems to be that of filtration of the sewers and drains. The entire system of sewers is stated, however, to be now receiving the consideration of the sanitary authority, who have adopted the advice of the medical officer and consulted an eminent engineer on the subject. Mr. Jackson gives the further advice that the action to be taken should be carried out before the warm season sets in. Another matter to which the medical officer of health has given particular prominence is the supervision of the slaughter-houses. Having received information that considerable traffic was going on in meat unfit for human food, he instructed the sanitary inspector to exercise great vigilance in this matter, and, as a result, no less than 102 visits were paid to the slaughter-houses in the borough during the last half of 1884. On five occasions unwholesome food (meat and bone) was seized and condemned, resulting in four prosecutions and three convictions. The water supply of the town, which has been very good, is being augmented to meet the requirements of the increased population. By-laws for the regulation of common lodging-houses seem to be required; and it is to be hoped that the endeavours to find a suitable site for a small-pox hospital or sanatorium will soon result in success.

BATH.—In his account of the precautions adopted during 1883 for restricting the spread of infectious disease this city Dr. Brabazon was loud in his praises of the

statutory hospital, which was largely appreciated by all classes. He also referred to the mistaken efforts of a local body of anti-vaccinators, and placed on record some figures indicating the value of vaccination as a prophylactic of small-pox, which the agitators will find difficult to disprove. Both in 1883 and in the past year the importation of a case of the disease led to the adoption of the usual precautionary measures, and with complete success, for no further illness was heard of. An outbreak of measles (fatal in 39 cases) increased the zymotic death-rate from 0.3 per 1,000 to 1.1; but the health officer points out that, as in 1883 when whooping-cough was very destructive, the large proportion of the mortality arose—not from the existence of sanitary defects, but from want of care and from unnecessary exposure. The report does not contain any account of the circumstances attending the eleven deaths ascribed to typhoid fever in 1884, but the prevalence of scarlatina is attributed principally to school influence. As compared with the previous year, there was a considerable decline in the mortality from chest affections, notably phthisis, and there were eleven fewer deaths from cancer.

GLOUCESTER.—The sanitary authority of this important city and port district will do well to carry out without delay the sanitary improvements which their health officer lays before them in his annual report for 1884, more especially as his recommendations are all reasonable, and can be effected without difficulty. Finding that a considerable proportion of the houses in the town derive their water supply from pumps and shallow wells which are more or less exposed to pollution, he urges that every house in the district should be connected with the city water system, and that wells should be closed. He also points out that a flushing box provided with water from the city mains should be secured for every water-closet; and that every house should be connected with the city sewers. At considerable length Mr. Wilton enters into the important question of hospital provision for infectious diseases, laying stress on the insufficiency and inadequacy of the present accommodation in the Stroud Road, and he expresses, in effect, a hope that will be generally shared, that the necessary 'sufficient and efficient' hospital accommodation will soon be provided for the city and port. With this view he concurs in the recommendation of Dr. Blaxall, who recently visited the district on behalf of the Local Government Board, that a hospital provided for the joint use of the urban, port, and rural districts of Gloucester would best meet the requirements of the case. The necessary watchfulness over lodging-houses, bake-houses, milk shops, and meat and fish markets was not neglected by Mr. Wilton during the year. The general death-rate of the city was 17.2 per 1,000, reckoned on a population of 39,373.

HANLEY.—Dr. Walker has taken considerable pains in working out the statistical portion of his annual report for 1884; but it has been to the exclusion of any general statement of his own work during the year or of the sanitary condition of his district. Nor does he indicate the directions in which the sanitary authority should put forth their energies; but he has possibly availed himself of other opportunities of doing this. The inspector's report which is appended, shows that the work of nuisance inspection, &c., is not at all at a standstill, 10,000 houses, &c., having been inspected during the year (468 by the medical officer of health himself), 500 re-inspected, 3,000, cleansed, &c. The general death-rate is somewhat high, being 21.0 per 1,000, and includes a zymotic rate of 3.6 per 1,000. A high rate of infantile mortality has prevailed in Hanley for some years past.

TORQUAY.—The sanatorium which was opened at Torquay in 1883 seems to have proved a great boon to the district, as was to have been expected. Mr. Karkeek gives numerous instances of his having been able by removing the first case in a locality to prevent the spread of infection. This he has been especially in a position to test during the past year, as scarlatina was always present.

During the twelve months 53 patients were admitted to the sanatorium; and the medical officer of health records the satisfactory experience that parents are becoming less opposed to their children being removed to that institution. They find that their children are well cared for there, whilst, by the removal, the bread-winning in the family is saved from disastrous interruption. The water supply of the district has been considerably increased by the opening of a new reservoir—an important matter in case of the recurrence of such a dry summer as was experienced in 1884. The dangers to which the public are unconsciously exposed, through the reckless use of doubtful water in manufacturing processes, is exemplified by a case, recorded by Mr. Karkeek, in which a well, long closed on account of pollution by sewage, was found to have been re-opened, and its waters used for washing bottles in a house where artificial drinks were made. There is always more or less difficulty in estimating properly the death-rate of a seaside resort, but, after deducting the mortality among visitors and strangers, the death-rate for the year was only 13·5 per 1,000 from all causes.

WALSALL.—The details of the sanitary work done in this borough, with its 60,000 inhabitants, are given in the tabular statements of the inspectors of nuisances, appended to the annual reports of the medical officer of health. It would be more satisfactory if the medical officer of health's report afforded a better index to the sanitary condition of the district. The death-rate in 1884 was 21·14 per 1,000, as compared with 20·03 in 1883, 18·4 in 1882, and 17·08 in 1881. The zymotic death-rate was 4·03 per 1,000. Scarlet fever and diarrhoea have been exceptionally prevalent and fatal during the last two years. In connection with an epidemic of small-pox in 1883, which caused 14 deaths, Mr. MacLachlan remarks that the effective manner in which the epidemic was stamped out should be recognised. Why, he asks, did the epidemic which, during 1872-3, carried off no less than 450 of the population of the borough, and caused the illness of 1,600, subside in 1883 with so comparatively slight a loss of life? Increasing care as to vaccination doubtless must be credited with some proportion of this result; but the confidence of the general public in the Infectious Hospital is the chief factor, and the prompt isolation of infected patients, which this confidence enabled the inspectors to secure, was rewarded by the safety of hundreds of lives.

WATFORD.—Dr. Brett's Annual Report for 1884 shows that he has not been idle as regards sanitary work in his district, although he has no striking sanitary defect to report upon at the close of the year. The need for a suitable hospital for infectious non-pauper cases is again brought forward by Dr. Brett, who points to the recent experiences of his district as sufficient evidence of the want of such provision. There is little in the water supply for the health officer to find fault with, but having regard to the fact that the supply is not unlimited, he remarks that there is still a great waste of water in the town. The sewers, he adds, must be ventilated, and 'the best means of effecting this is by open gravings in the road.' During the year many courts and yards were much improved, but still some of the houses 'are hardly fit for human habitation.' The death-rate was 17·8 per 1,000 (including a zymotic rate of 1·6 per 1,000) reckoned on an estimated population of 12,950.

WEDNESBURY.—Mr. Garman does not devote any portion of his report to an account of the action taken for improving the sanitary condition of the district. In speaking of the decreased mortality from typhoid fever, however, he observes that it is a source of gratification to know that this disease of late years has only appeared in a sporadic form, which, he thinks, indicates a general improvement. The good water supply which the town possesses, more scrupulous attention to the midden system, frequent emptying of ashpits, and the complete supervision of all nuisances injurious to health, have done much,

whilst the inhabitants have become so reconciled to the sanitary officers and their duties in pursuing house-to-house visitations that people have become, so to speak, educated to cleanly habits and keeping their houses in order. All these circumstances tend materially to resist the chances of any serious spread of typhoid fever. There were in all 88 deaths registered from the principal zymotic causes, against 121 in the previous year. Scarlet fever seems to be endemic in the district, having been more or less prevalent since 1877. In 1878 the great wave was reached, when scarlatina was responsible for 90 deaths. A declension was experienced in 1879, but another surging of the wave occurred in the following year. From that date the mortality has steadily declined, and Mr. Garman hopes that, now the disease has shown signs of abating, further progress in the sanitary improvement of the district may be the means of completing its entire exhaustion and effacement. Of the 21 deaths registered from diarrhoea, 17 occurred in children under five, though Mr. Garman, in recording this mortality, protests against its being regarded as of a zymotic origin. Whooping-cough, a disease over which sanitary authorities can exercise but little control, was unusually fatal, and there was some prevalence of diphtheria which was concurrent with scarlet fever. Several cases of small-pox appeared in the district, and there was a mild epidemic of measles. Pulmonary affections were much more fatal than in the previous year, but the mortality amongst infants was below the average.

WITHINGTON.—In reporting on the sanitary condition of this growing district during 1884, Dr. Railton records that in view of the prevalence of cholera in Europe the local board last year issued a useful circular urging owners and occupiers to put their houses in order, and pointing out the essentials of a healthy house and the directions in which they should criticise their dwellings. This seems to have had the beneficial effect of arousing an anxiety among many householders to ascertain the sanitary deficiencies of their dwellings and have them remedied. The keeping of pigs seems to require regulation in Withington, and the medical officer of health suggests the adoption of a by-law on the subject. He observes that 'there can be no doubt that pigs create a disgusting nuisance, however clean their styres may be maintained, and it appears to be an injustice to others that the law should permit persons to keep them within a certain distance from the houses.' The death-rate from all causes was only 13·0 per 1,000, but this includes a somewhat high infantile mortality which is evidently a source of anxiety to the medical officer of health. He, however, looks on diarrhoea among infants as more generally attributable to improper feeding and careless treatment than to bad sanitary conditions. The advantage of the removal to hospital of early cases of infectious disease was demonstrated in connection with the outbreak of scarlet fever in the district during 1884. Sixteen cases in all were removed to the Monsall Hospital, and the extension of the disease was thereby undoubtedly limited.

A NEW feature in sewage treatment is that just opened at Buxton, where a superior sample of effluent water is being discharged from settling tanks in which precipitation is effected by a process hit upon by a happy accident and the ingenuity of Dr. Thresh. Defecation is accomplished by a natural chalybeate spring flowing out of a disused mine; and this mixed with milk of lime is stirred into the sewage, and not only sends down all the visible impurities in a flocculent precipitate, but also removes a considerable proportion of the dissolved organic matter. The resulting sludge is declared to be of higher value than the majority of manures made from water-carried sewage. The chalybeate stream contains about two grains of carbonate of iron and ferric oxide per gallon, also fifty grains per gallon of mixed crystalline sulphates, or salts of alumina, magnesia, lime, and soda.

SURVEYORS' AND SANITARY INSPECTORS' REPORTS.

BARTON ECCLES.—Mr. Heywood, the surveyor of this district, enumerates in his report the number of streets which were sewered and paved in 1883, and records how many plans of new buildings were passed. Four additional connections were made between the shallow sewer and the deep one in Eccles to prevent the flooding of cellars, and a number of storm and other grids were fixed during the year. The report of the sanitary inspector, Mr. Lee, indicates that particular vigilance was exercised in securing the trapping of gullies and the fixing of ventilating shafts to soil-pipes. A distinct improvement was the diversion of the drains of a considerable number of houses, which had been so constructed as to allow the sewage to flow into watercourses, and their connection with the main sewer. The removal of refuse seems to have been fairly well performed; but Mr. Lee regrets that the inhabitants cannot be persuaded to exercise more economy by consuming the cinders and keeping the rubbish out of the ashpits, which would considerably reduce alike the nuisance and expense.

BLACKPOOL.—Mr. MacDonald's report consists of a statement of the nuisances abated by him in 1883, which amounted to no less than 29,395. In this number, however, the inspector includes the emptying and purifying of 22,021 ashpits and tubs, and the removal of 6,564 loads of ashes. The principal work of the year included the draining of thirty houses into the main sewers, the trapping of thirty down-spouts, the disconnection of forty slopstone pipes, the furnishing of eighteen houses with a proper supply of water, and the erection of twenty closets. Fifty manure middens were removed, twelve cellars were drained, and twenty ashpits were reconstructed. On the whole, the routine work seems to have been satisfactorily performed, but in future reports Mr. MacDonald would do well to supplement his statement with some comments or explanatory remarks.

CHELTHENHAM.—Mr. Long reports that in 1883 he issued a large number of notices, of which 172 required the opening, cleansing, or trapping of drains, 75 the removal of pigs, 120 the limewashing of cottages and closets, 13 the abatement of overcrowding, 17 the repairing of pumps, and four the provision of water. It would be desirable, however, that the report should state the result of these notices, as in the absence of this information it is impossible for the uninitiated to appraise the value of the inspector's work. The sanitary organisation of Cheltenham is, as a matter of fact, particularly good; but it is better to put the results of work upon record.

DUNDEE.—In his report for 1883, which is well and practically written, Mr. Kinnear dwells at length upon the evils arising from defective plumbing which were observed by him during the year. Altogether there were 180 dwellings examined on this account, and with but five exceptions all were found in need of improvement through defective material, and sometimes through the carelessness or maliciousness of the occupants. In twelve of the houses it was necessary to replace the existing water-closets with new ones, and eighteen old dwellings, which formerly had no conveniences whatever, were provided with closets on the wash-out principle. The cesspools or water-seals under, and the soil-pipe piping from a number of closets and sinks within houses, were badly perforated with holes, leaving a free passage for gas from the sewer to enter the houses. The complaints lodged at the office were principally from this cause. In a large proportion of the lead-piping and cesspools, or water-seals taken out, numerous corroded holes were found, clearly traceable to the action of sewer air. Tradesmen, Mr. Kinnear adds, were not altogether free from blame for the imperfect workmanship and light lead material which was frequently

observed when the old piping was removed. Considerable improvements were effected in the drainage. Out of a total of 170 dwellings examined, five only were found in anything like a wholesome condition. The drains of the other 165 were so imperfect in workmanship as to necessitate considerable repairs or total reconstruction. To do this, 1,613 yards of new glazed fire-clay 4, 6, and 9-inch pipes were used, and 894 yards relaid and properly jointed. In addition, 98 ventilating traps, having fresh air perforated iron inlet plates, were placed upon the drains, to isolate the buildings from all direct communication with the main sewer. In other respects sanitary improvements were rapidly pushed on, whilst the dairies and milkshops, common lodging-houses, &c., did not escape a close inspection, regard also being had to the abatement of smoke nuisances. The year under notice seems, indeed, to have been a laborious one for Mr. Kinnear.

GOVAN.—The yearly statistical tables prepared by Mr. McKay, the sanitary inspector for the burgh of Govan, present a great variety of work performed by the department. The report is divided into nine different heads, beginning with infectious diseases, of which there were 349 cases registered, 430 apartments fumigated and white-washed, the clothing of 250 families washed and disinfected, 2,058 visits made to houses in infected localities, and 259 notices sent to School Board and teachers regarding infected houses. There were 1,107 nuisances removed, of which 452 refer to drainage. Sixty-one new houses have been placed on the register of 'houses let in lodgings,' while 652 daily and 307 nightly visits were made to enforce ventilation and cleanliness and prevent overcrowding; 5,263 reports were sent to the cleansing contractor, and 348 occupiers in tenements were notified to sweep and clean back courts. Under the heading of 'Unwholesome Food and Sale of Food and Drugs Acts' we find 21 inspections under the former and 7 samples procured under the latter. There seems to have been a great amount of alterations effected under the provisions of the Cattle Sheds Act in providing or repairing floorings, gripps, drainage, &c. The smoke test seems to be pretty well employed, as 178 houses had their drainage tested, resulting in the removal of offensive smells and other defects. A very important suggestion has been made by Mr. McKay in effecting an arrangement whereby every death from infectious disease should be daily reported to him, which we believe has received the sanction of the Board.

HEBDEN BRIDGE.—Mr. Smith reports that the structural works carried out during 1883 for improving the sanitary condition of this district were of more than usual magnitude and importance. The most conspicuous and costly undertaking of this kind was the draining and paving of several streets; whilst in a number of others, in which the drains were laid in a very imperfect manner, the pipes were taken up and larger ones fixed in their place. In addition to this, 57 house-drains were repaired or entirely replaced, 46 were trapped and 18 disconnected. The number of nuisances dealt with amounted to 169, of which 50 arose from offensive accumulations, 23 from defective privies, and 81 from choked or otherwise imperfect drains. The scavengers emptied 2,606 closet-tubs, as against 2,080 in the previous year, and removed 360 loads of ashes and other refuse. Frequent visits were paid by the inspector to the common lodging-houses, and in two some important improvements were carried out.

IPSWICH.—Mr. Moss reports that in 1883 he inspected 3,844 houses and premises, and issued 341 notices for the removal of nuisances or the execution of minor sanitary improvements, all of which were attended to. As many as 333 private drains were reconstructed, repaired, cleansed, and trapped, and a considerable number of privies were altered for the better. In nine cases the public supply of water was laid on to dwellings, and two polluted wells were closed. Some trouble seems to have

been caused by the improper keeping of animals; but in no case, either as regards these or other nuisances, was it necessary to resort to legal proceedings to secure compliance with the inspector's requirements.

KNARESBOROUGH RURAL.—In his annual statement for 1884 Mr. Gray, the sanitary inspector, reports that 634 nuisances had been recognised and 634 formal notices issued, 66 houses disinfected, 109 complaints registered, 14 wells cleaned out and effectually covered, 4 new wells sunk in pursuance of Water Act, 615 nuisances removed, and 1,385 yards of new drains had been laid. Four samples of milk had been tested by the public analyst and found pure. Certain minor matters, to which the attention of the authority was directed in the report, appear to have been satisfactorily disposed of.

LEEDS.—That a very large amount of work was got through by the officials of the Sanitary Department of this borough in 1883, the fact that something like 15,000 houses were inspected sufficiently proves. Yet the superintendent, Mr. Newhouse, confesses that he does not feel satisfied with this return, large though it be, for there can be no doubt, he states, that it is in the house itself that the most serious evils which the department has to contend with arise. He thinks, however, that with the limited power local authorities possess under the present Acts, more cannot be done; but he hopes the time is not far distant when their powers in this respect will be enlarged. Another difficulty is met with in dealing with the drainage of houses both old and new. A dwelling-house, to be properly drained, should have the connection with the sewer completely cut off by running the sink-pipe on to the surface, and then near to, but not into, a gully with intercepting ventilators. In Leeds, however, this object can rarely be attained, owing to the existing plan of back-to-back houses, which are flush with the streets. Extended powers are needed to compel owners of property to make improvements in this direction. While admitting that the Order in Council for the Inspection of Cowsheds, Dairies, &c., is right in making it incumbent upon local authorities to inspect such places, and order the alterations required to put them into a proper sanitary condition, Mr. Newhouse is of opinion, at the same time, that it is a great injustice to the occupiers to make him, and not the owner, responsible for the carrying out of the necessary alterations and repairs before the premises can be registered.

LEEK.—The epidemic prevalence of scarlet fever in this district entailed considerable labour on Mr. Farrow, who had to see to the removal of 212 cases of this disease, and the disinfection of 33 houses and of 1,112 articles of clothing and bedding. In addition to this, a large number of nuisances were abated, which arose for the most part from defective drainage. In 19 houses the closets were improved, and in 9 a proper supply of water was provided. The contractor for the removal of refuse and night soil seems to have done his work well, but several nuisances arose from the carriage of offensive matter through the streets. The report concludes with some tables of local interest, including the number of admissions to the hospital and a statement of the number of interments in the town.

NEWCASTLE.—The annual report of Mr. W. T. Clark, chief inspector of nuisances, presented to the Town Improvement Committee of the Corporation, shows that during the past year 1,344 complaints were received, 9,879 notices were served, exclusive of 2,063 letters written, and 3,918 special inspections were made. The number of streets inspected was 532; houses, 10,821; and tenements, 14,899. There arrived and were inspected during the year 236 boats, with 39,932 packages of fish, being a considerable increase on the previous year. We also learn with much satisfaction that it has not been found necessary to institute magisterial proceedings during the year, as owners and agents of property have, upon full explanation of requirements being given, willingly done all the necessary works. May we add—Other districts, please copy.

SALTLEY.—Mr. Payne's report, which is in the form of a statement, shows that sanitary work was actively carried on in this district during 1883. The public water supply was extended to 43 houses, and 36 drains were connected with the main sewer, 57 being cleansed, altered, and repaired. Proper regard was had to the removal of refuse, 946 privy-pans and 740 ash-pits having been emptied during the year. Mr. Payne issued 124 notices for the abatement of nuisances, which, with four exceptions, received attention. The plans for the building and alteration of 43 dwellings were approved, and the slaughter-houses and bakehouses were periodically inspected.

SCARBOROUGH.—Few sanitary inspectors have been able to record the performance of so much useful and permanent work as Mr. Finlay chronicles in his last report on this popular health-resort. Especial attention was directed to altering the defective sanitary arrangements of private dwellings, and the inspector observes with satisfaction that there are now many persons who recognise the need of sanitation. Out of a total of 1,854 houses inspected, 72 certificates of sanitary excellence were granted to lodging-house keepers. As many as 500 pan-closets were altered on an improved plan, and a large number of soil-pipes were brought outside and properly ventilated. In 432 houses sanitary gullies were fixed in the place of old and dilapidated brick ones, nine large cesspools and three wells were abolished; upwards of 50 rain-water cisterns under dwelling-room floors were done away with, and 20 old brick drains were destroyed, and sanitary pipe-drains laid in their place. Care was taken to strictly enforce the by-laws relating to slaughterhouses, bakehouses, &c., and a sharp look-out was kept on offensive businesses. Mr. Finlay's report, which deserves a word of praise for its excellent arrangement, concludes with an account of the system of refuse removal and street watering and cleansing, and some useful statistical tables.

SHIPLEY.—Mr. Smith seems to have been unusually active in this district, and his report for 1883 contains a lengthy list of the improvements effected during the year. Thus he records that as many as 987 sink-pipes were either trapped or disconnected, and that a change for the better was made in the drains of 50 houses. A large number of nuisances arising from offensive accumulations were immediately abated, and 2,000 notices were issued to the inhabitants, warning them of the danger of permitting masses of filth near their dwellings. In common with many other inspectors, Mr. Smith found that many of the better-class houses were in a far worse sanitary condition than cottages, as for the most part they had dangerous soil-pipes inside the dwelling, which had become perforated, worm-eaten, or so destroyed as to readily permit of the escape of sewer-gas. There were 246 notices issued during the year for the abatement of nuisances, of which 222 had been complied with at the date of the report.

TODMORDEN.—In reporting that the sanitary condition of his district was fairly satisfactory at the close of 1883, Mr. Blackburn notes with satisfaction that some of the owners of property, as well as the occupiers, have co-operated with him in removing, and in a number of cases preventing nuisances. As many as 21,460 privies were emptied during the year, but the mode of removal does not seem of the best. Five street sewers were laid or repaired, and 27 house drains were cleansed and otherwise improved. As in the previous year there were several cases of typhoid fever which arose from the consumption of polluted water, and scarlatina assumed at one time the proportions of an epidemic. Proper regard was had to the disinfection of infected houses, and in other respects the sanitary welfare of the district received attention.

WALSALL.—An enormous number of nuisances were abated in this borough by the sanitary inspectors, Messrs. Stephens and Harries, whose joint report consists of a number of statistical tables with occasional comments. In

on to the removal of unsanitary conditions, 287 s were supplied with water, 1,644 yards of new drains laid, 14 privies, 32 ashpits, and 107 water-closets erected, and 168 house drains trapped. A systematic tion of the borough involved the visiting and nation of no fewer than 8,889 dwellings, and led to rrying out of many useful sanitary improvements. ask of collecting samples of food and drugs seems to been efficiently performed, and an examination of the supply led to the detection and destruction of much as unwholesome and unfit for food. The borough nvaded with a serious epidemic of scarlatina, and in onnection a warm tribute is paid to the inspectors e health-officer who observe, that he cannot ade- ly express his admiration of the zeal with which, an anxious period, these officers laboured night and o prevent the infection spreading.

BRINGTON.—The scavenging of this borough rel- particular attention in 1883, and there now remains le cause for complaint, which in previous years was ntly heard. This end has been largely brought by the gradual extension of the pail system, which rst commenced in August 1872, when there were losets of this kind in the town. There are now 7,537 in use, the number of midden-privies having been ed to 99. As many as 402 nuisances were abated by rman, the inspector, whose vigilance in the den- of unwholesome meat deserves a special word of .

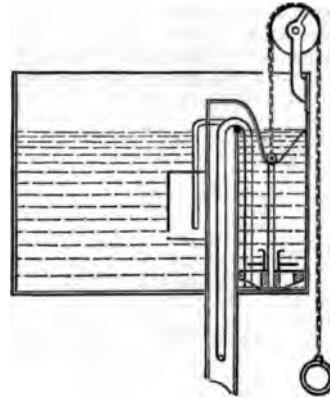
An inspection of the common lodging-houses led : punishment of nine owners for infringing the by- by the infliction of fines amounting to 10/. The , which concludes with some information of local st, does not deal so fully with the nature of the ces abated as could be wished.

DNESBURY.—This report is above the average, for, lition to recording the actual work performed during ear, Mr. Coney appends some remarks as to the of the various improvements. He reports that on encing his duties he found a large number of ash- rom which liquid filth was leaking. He therefore ed special attention to the matter, with the result of ng a more systematic emptying and cleansing. The n of lending whitewash brushes was much appre- by the inhabitants, as many as 481 brushes having lent and re-lent during 1883. The markets, common g-houses, and slaughter-houses were periodically d, and found to be in a fairly satisfactory condition. ge number of minor improvements, such as the trap- of drains, repairing yards, altering ashpits, &c., were d out during the year, and Mr. Coney reports that e most part he found owners of property quite willing nply with the notices served upon them, and although uisances were registered and 270 notices issued by in no case was it necessary to resort to legal pro- g.

EXHAM UNION (RURAL) NORTHERN DIS- .—In his annual report for 1883 the inspector is district, Mr. H. Davies, states that the greatest ulty which he has to contend with is the removal gnant water. It is evident from this statement the district is very imperfectly drained, and that is urgent need for an improved system of sewers. satisfactory to find that some efforts were made is direction during the past year; and that, in on to 167 houses being connected with the main s, 124 notices were given to make, repair, or alter , and that 32 new drains were actually made, while me of the other cases improvements were effected. remaining work comprised the condemnation of 1 houses as unfit for habitation, the erection of y-two new privies, and the conversion of seventeen es into pan-closets, the removal of eighteen pigsties, he cleansing of some half a mile of ditches where e had lodged. Notices were served to construct s, and to provide ventilation; but without detailed s very little (the inspector states) can be enforced.

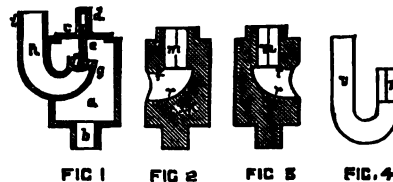
ILLUSTRATED SANITARY PATENTS.

1,520. (1884.) IMPROVEMENTS IN WATER-WASTE PREVENTERS. B. HAIGH, Cubitt Town, Middlesex. [6d.]—This contrivance consists of a syphon arrangement for the ordinary flush, and also for an after flush where required. A draw chain working over a pulley raises a plunger within a cylinder. On the top of this plunger a



loose disc lifts the water in the cylinder into the discharge-pipe, and then opens the passages in the plunger by the current of water, thus making the syphon and discharging the required water, the plunger and disc then dropping back to their original place. The small syphon-pipe for after-flush is within the main discharge-pipe, and is set in motion by the vacuum formed in the main pipe from the ordinary flush.

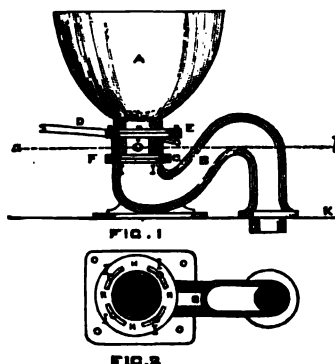
3,347. (1884.) IMPROVEMENTS IN THE CONSTRUCTION OF STENCH-TRAPS FOR SANITARY AND OTHER PURPOSES. T. S. TRUSS, Chiswick, Middlesex. [6d.]—These improvements relate to the construction of stench-traps with spindle-valves that form the seal for such traps independent of any liquid, and also prevent any fluid entering such traps by their outlet-pipes from ascending through such traps. Fig. 1 is a longitudinal section of a stench-trap constructed according to the first part of the said improvements, in which *a* is the box, and *b* is the outlet pipe, and *c* is the cap on the top of the box *a*, and *d* is the socket formed in such cap for the spindle *e*, attached



to the valve *f*, to work in, and *g* is the end of the inlet pipe *h*, that is within the box *a*, on which end of such inlet-pipe the valve *f* acts, and *i* is the end of the inlet-pipe *h*, that is outside of the box *a*. Figs. 2 and 3 are longitudinal sections of the two parts of the body core for forming the interior of the box and outlet-pipe and the exterior of the inlet-pipe that is within the box; and fig. 4 is a longitudinal plan of the core for forming the interior of the inlet-pipe, in which figs. *k* is one-half of such body core, and *l* is the other half of the same, and *m* is the recess therein for the print *n* on the end of the inlet-pipe core *o* to rest in; and *r* is the space in the parts of the body core *k* and *l*, that forms the end *g* of the inlet-pipe *h* that is within the box *a*.

3,754. (1884.) IMPROVEMENTS IN ATTACHING WATER-CLOSET BASINS TO THEIR TRAPS: H. CONOLLY, London. [6d.]—The object of this invention is to attach

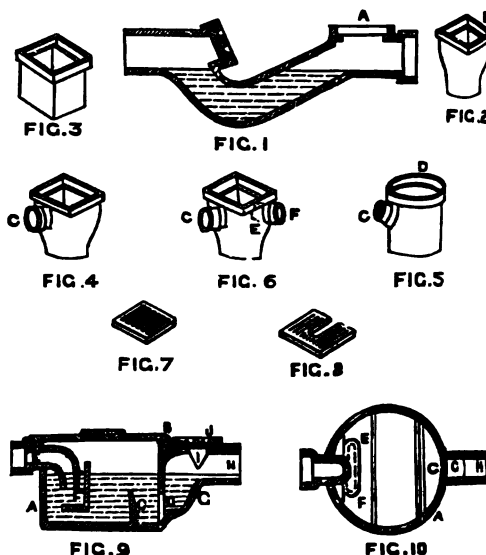
water-closet basins to the separate traps thereof in such a manner that the trap can be fixed in any required position in respect of the basin, thereby allowing one to place and erect the said basin in that position in regard to the soil-pipe as may be necessary or convenient in each particular case without it being obligatory, as is usually the case, to form the trap in a special particular manner for each apparatus. This object is carried out by interposing between the water-closet basin and the separate trap thereof a collar or short piece of pipe of the required shape and length and size in cross section and the several parts of the basin and the collar and the trap are connected and attached together, as is hereinafter described. Fig. 1 is an elevation of the closet, and fig. 2 is a horizontal section thereof taken at *a b* in fig. 1. A is the closet basin,



between which basin and the separate trap B thereof he interposes the collar or short piece of pipe C of the required dimensions, in which collar C is the bottom valve of the closet basin actuated by the lever D. On each end of this collar C he forms a flange, and the upper flange E is made of the same shape as the ordinary or other flange formed on or fitted to the bottom or neck of the basin A, and the said flange E is secured thereto in any convenient and suitable manner, preferably by screw bolts and nuts, as shown in the drawing. The lower flange F of the collar C is made of a circular or annular shape, and is secured to a corresponding and similar flange G formed on the end of the separate trap B in any convenient manner, to allow the said trap B to be fixed in the required position in respect of the basin A, so as to lead direct to the soil-pipe. These two flanges F and G may be secured together by clips on their outer peripheries or otherwise, but he prefers the method shown in the drawing. According to this method he forms in one of these two flanges F and G, preferably in the flange F on the collar C, a series of slots H and the bolts I, which are passed through holes in the other flange, preferably in the flange G on the trap B, pass also through these slots H, and can travel along the same, being secured above by screw nuts. Thus and in this manner the trap B can be fixed in any required position in respect of the basin A.

3,814. (1884.) IMPROVEMENTS IN DRAIN TRAPS, GREASE TRAP, &c. : W. H. TYLOR, London. [6d.]—In the drawings hereto annexed fig. 1 illustrates an ordinary disconnector trap, to the socket-branch (A) of which definite extension pieces may be applied. Figs. 2, 3, 4, 5, and 6 show various forms and arrangements of the extension pieces, and figs. 7 and 8 show ventilating gratings applicable for use with the said extension pieces. Fig. 2 shows a plain extension piece, the lower end of which is adapted to be placed in the socket A of the disconnector trap (fig. 1), the upper end being provided with socket or recess (B) to receive the usual air inlet grating (fig. 7 or 8), or another similar extension piece (fig. 3) above it, according to circumstances. Fig. 4 shows a similar extension piece, provided with a socket (C) for an air inlet pipe at its side or other position. Fig. 5 shows a

similar extension piece adapted to receive a leaden soil-pipe direct into its socket (D) at the top. This extension piece may also be provided with a socket or other pre-



paration (C) to receive an air inlet pipe or other ventilating device. Where it is desired to run the wastes of baths or sinks into disconnector traps he uses special pieces, such as that shown at fig. 6, provided with a downwardly bent pipe (E), shown in dotted lines, connected with the inlet opening (F) by which the waste enters from the bath or sink; C in this figure represents the socket or other preparation for the air inlet pipe, as in figs. 4 and 5. When the soil-pipe discharges into an open extension piece the notched grating (fig. 8) is employed, instead of that shown at fig. 7. By these arrangements disconnector traps can be connected with the surface, or otherwise ventilated with great facility, as the extensions are adapted to fit into one another, so that if one piece is not sufficient two or more can be combined together. The improvements, so far as they relate to traps for separating fat from liquids, are shown in figs. 9 and 10. A is a box with a cover, B, fixed airtight thereto. C is a partition crossing the box, A, and extending upwards from the bottom to a height about equal to or a little higher than that of the top of the outlet opening D. The inlet E to the box is bent downwards inside the box, and made oblong at the lower end, as shown in fig. 10, or it may be made otherwise. The liquid with the fat enters at E, and strikes the separating plate F, causing the fat to be broken up into small pieces, detached from the liquid and allowing it to float to the top. The liquid then passes under the separator plate (F) towards the outlet, and strikes the above-mentioned partition C, causing still further separation of fat, which rises to the top of the liquid, and the latter flows over the top of the partition C, to the outlet opening D. This outlet opening, D, for liquid is placed near the bottom of the box, A, at the end opposite to that at which it entered, and is trapped by the trap, G, the overflow pipe, H, from which is placed, as shown, at a somewhat higher level than the opening, D. I is a handhole for cleaning out the trap, G, which handhole may be closed, when not in use, by the plug, J. The fat, being retained floating on the surface of the liquid in the box, A, cannot escape by the opening, D, because the surface of the said liquid is maintained above it by the trap, G, and can be removed at pleasure after lifting the cover, B.

6,014. (1884.) IMPROVED VENTILATOR : W. COWELL, Blackburn, Lancashire. [4d.]—Fig. 1 is a front elevation showing four vanes, and Fig. 2 is an end elevation

overflow when one is fixed to it, and also cleansing the overflow from any of the contents of water-closet that may have escaped down it. This cleansing pipe is fixed at top of supply pipe and not at the bottom, so if valve at supply



FIG. 1.



FIG. 2.



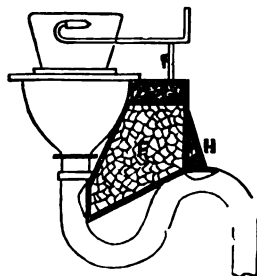
FIG. 3.

leaks the water does not escape down the cleansing pipe but runs through the supply pipe into the water-closet basin, and is thus able to be detected. The cleansing pipe can be placed from any portion of an outer flushing rim or from the supply pipe to overflow, whatever their position on the water-closet basin may be.

AMERICAN.

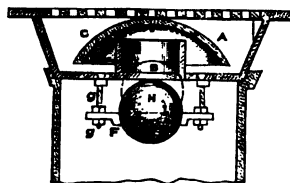
293,305. ATTACHMENT FOR WATER-CLOSETS: LUTHER H. BURNETT, Chicago, Ill. Filed April 4, 1883.

Claim.—1. In a water-closet, the combination of a chamber to receive a suitable chemical, and having a perforated bottom, and a pipe for conducting water to the chamber to dissolve the chemical, with a box which is filled with charcoal, through which the dissolved chemical



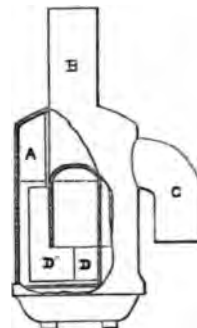
flows into the waste-pipe. 2. The combination of a chamber to receive a chemical, and having a perforated bottom, a pipe for conducting water into the chamber for the purpose of dissolving the chemical, and a chamber, F, for receiving powdered charcoal, and which is connected at its lower end with the waste-pipe, with a chamber, H, through which the gases are conducted from the waste-pipe into the chamber containing charcoal.

303,430. SEWER-TRAP: JOHN W. GRIFFIN, Buffalo, N.Y. Issued August 12, 1884.



Claim.—1. The combination, with the receiver A, provided with the discharge-opening B, of a ball-valve, H, seated in an annular plate, F, arranged below the discharge-opening B. 2. The combination, with the receiver A, provided with a discharge-opening, B, having an elevated mouth, b, and bell C, of an annular ring, F, suspended from bottom of the receiver A by bolts g and screw-nuts g', and a ball-valve, H, seated in the annular ring F, below the discharge-opening B.

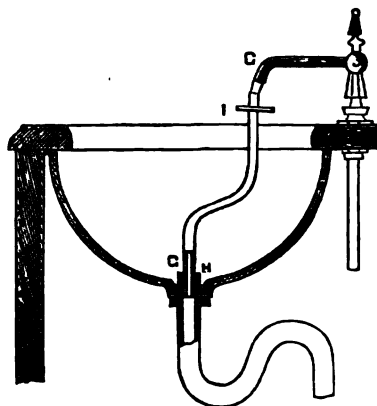
303,640. SINK-TRAP: BENJAMIN HOLLAND, Jr., Providence, R.I. Issued August 19, 1884.



Claim.—1. In a sink-trap, provided with the chamber A, the pendent pipe B, and the discharge pipe C, the partitions D D, extending from said pipe B to the walls of the chamber A, and from the lower end of the pipe B to or above the lowest side of the mouth of the pipe C, and an opening in the side of the pendent portion of the pipe B for the escape thereof of air above the lower edges of and between the partitions D D. 2. The combination of the chamber A, the discharge pipe C, the pendent pipe B, having a portion of its circumference made shorter at its lower end than the other portion, and the partitions D D, connecting said pipe B with the wall of the chamber A, and extending downward to the end of the longest part of said pipe B, and enclosing the cut away or shortened side of said pipe.

303,858. BASIN TRAP CLEARER: JAMES E. KELSEY, Brooklyn, N.Y. Issued August 19, 1884.

Claim.—1. A clearing pipe for basins, consisting of the flexible pipe G, provided at one end with a hollow tapering stopper, whereby the waste pipe and faucet may be connected. 2. A clearing pipe for basins, consisting of the flexible pipe G and the disk I thereon. 3. A basin trap clearer, consisting of a flexible tube (G) for connecting the faucet with the outlet or waste pipe, provided at one end with a hollow flexible stopper H, and near its other

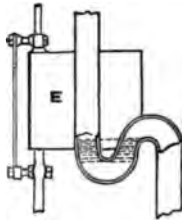


end with a flexible disk I, whereby the clearer is adapted to be applied to basins having large or small outlets by simply reversing the tube.

303,822. SAFETY FLUID TRAP: RUDOLPH D'HU-REUSE, New York, N.Y. Issued August 19, 1884.

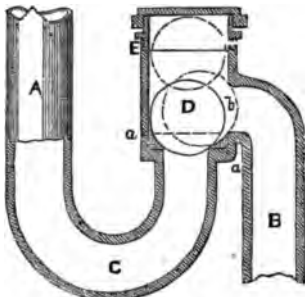
Claim.—1. A trap for waste-pipes, wash-basins, &c., combined with a close or air-tight vessel for water or liquid disinfectant or deodoriser, and provided with a discharge outlet, which communicates with the interior of the trap between the overflow or discharge level and the sealing or safety level thereof, whereby the water in the

prevented from falling below the danger line, sub-
y as described. 2. In combination with a trap,
el E, constructed as described, and having a dis-



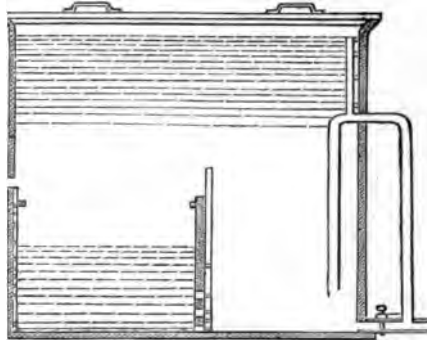
outlet which communicates with the interior of the
ween the overflow and the danger levels, and pro-
with a water-supply pipe and devices whereby water
admitted thereto and air discharged therefrom
ously, substantially as and for the purpose set
Also other claims.

36. ANTI-SYPHONING TRAP: FRANCIS WILLIAM
Minneapolis, Minn. Issued September 9, 1884.



1.—The combination of the trap pipe C, having
horizontal valve seat a, the valve chamber E over the
ve seat, the overflow pipe B, leading from one side
valve chamber, the vertical valve seat b at the
into the overflow pipe, and formed to seat a ball
nd the ball valve D, whereby the valve is made to
several purposes of closing the trap pipe against
d flow, of closing the overflow pipe against
g the trap, and of rising into the chamber above
ve seats to allow a free discharge of liquid through

81. GREASE TRAP: NATHANIEL T. WHITING,
San Francisco, Cal. Filed September 23, 1883.



1.—A grease trap, consisting of a chamber having
inlet pipe opening into it below the surface of the
n outlet pipe having its receiving end opening into
nber at a point below the level of the inlet pipe
ring upward, so that it discharges above the level
pipe, a removable perforated sediment chamber
g upwardly from the bottom of the main chamber
1, and a vent pipe extending upwardly within the
from the discharge pipe.

REVIEWS.

The Care of Infants: A Manual for Mothers and Nurses.
By Miss SOPHIA JEX BLAKE. London: Macmillan &
Co. 1884.

IN a compact useful little volume, entitled 'The Care of
Infants,' Miss Jex Blake has added to the already long list
of manuals on this subject. Unlike some of its prede-
cessors, if it contains sins of omission there are few of
commission. There is little said in it that had better be
left unsaid. The advice and directions, as far as they go,
are mostly excellent. Some of the questions connected
with infant life, which are but lightly touched upon, might
with advantage be more fully treated. For instance, in
the directions for bathing, the nurse is told that a new-
born child should be washed in a bath in which its whole
body is covered, and its head supported by the nurse's left
hand. This is undeniably true, and is the manoeuvre of
an experienced nurse, but how to achieve it without
receiving preliminary teaching or directions? These Miss
Jex Blake does not furnish. This omission, with some
others, may be considered only a minor defect, but never-
theless prevents the manual from being so thorough a
guide as its author is evidently capable of making it.
Again, that all-important question of infants' clothing,
which so loudly calls for reform, Miss Jex Blake, after
condemning the use of pilches, disposes of by saying
'the rest of the baby's clothing will probably follow the
prevailing fashion.' But from a medical point of view,
simplicity, lightness, and warmth are chiefly to be de-
sired; but how to attain these hitherto unattained
desiderata in infant management Miss Blake does not
venture to suggest, though our hopes were raised that she
would do so by seeing it announced on the title-page that
she holds the position of Lecturer on Hygiene at the
London School of Medicine for Women. New-born in-
fants are the only examples of living human beings which
are clad in the same fashion winter and summer—in their
airy trifles pleasing to the eye, but wholly unfit to
realise such conditions as 'simplicity, lightness, and
warmth.' That homœopathic dose of cambric called a
baby's chemise—a fatal cold-giving piece of frivolity—
ought certainly to be replaced by one measuring a
sufficient number of inches to reach up to the tiny baby's
tiny throat. The same happy innovation might be intro-
duced among the remaining articles of infant clothing,
besides many others which it is not the critic's duty to
discuss, but would be a truly fit subject to be treated in a
manual on the care of infants. The all-important period
of infant life, that of teething, Miss Blake passes
over by saying 'that at the fifth or sixth month
the baby begins to dribble—it secretes saliva. The
teeth will soon be coming, but it is not necessary to wait
for their appearance, before giving small quantities of rusk
and tapioca.' These scanty data might perhaps help to
answer an examination question or two, but would be but
a poor guide and solace to an anxious ignorant young
mother, who, poor or rich, seeks for information beyond
that possible to obtain from a doctor's occasional visit.

Miss Blake's suggestion that 'except in severe weather
it is much better to secure a constant current of pure air
by keeping a window more or less open night and day,
except during the baby's toilet,' seems to us rather heroic,
and calculated to increase infantile colds and bronchial
affections. Perhaps Miss Blake in her practice has, in
exceptional instances, found this advice to be salutary; but
it would be dangerous to give it broadcast. The author
rightly objects to apertures being formed under the door
that air may flow in, because when children begin to crawl
about they are directly exposed to a strong current of air;
but a ventilator placed on the uppermost panel of the door
removes this danger, and permits a current of air to be
admitted or excluded at will, as circumstances require. It
is quite wise to condemn 'parents who are in a great hurry
to give meat and fish to their children;' but when Miss

Blake expresses her belief 'that those who have little or nothing of the kind until they are five or six years old,' are properly fed, and recommends that they have 'up to that age an abundant diet of milk and farinaceous food,' we would suggest that she goes to the other extreme, and is too tardy in supplying them with the requisite quantum of nitrogenous food.

If we have assumed the more disagreeable task of pointing out the deficiencies of this truly excellent little volume, we have done so in the interests of ignorant young mothers and novice nurses, hoping that in a future edition Miss Blake will fill up the now existing hiatuses, and thus render her manual as perfect as a whole as it is now in parts. In its present form, all who have the care of infants will do well to read it with attention; they will find in it much useful information and excellent advice which will carry them through many, if not all, the difficulties that beset infant life.

Dwelling-Houses; their Sanitary Construction and Arrangements. By W. H. CORFIELD, M.A., M.D., &c., &c. Second Edition. H. K. Lewis, Gower Street.

THIS is the second edition of Dr. Corfield's admirable little work. Expressed in plain terms without any elaboration of details, and fairly well illustrated, this is just the work for a popular handbook on the subject, and if it could be slightly abridged and brought out at a nominal charge it would be of great benefit to the public at large and would achieve, we believe, an immense sale.

The book before us is pretty well known to consist of the Cantor Lectures which its author delivered before the Society of Arts. The subject of house sanitation is treated of in a popular manner by a medical man of considerable experience. The engineer's point of view is, of course, not considered, and wisely so. For as there are many clever works written by engineers from their own standpoint, it is well that Dr. Corfield should have confined himself to his own view of the subject, which he has placed before us in so simple and effective a manner.

There are a few points that we should have been glad to have seen modified in this edition of the work. For instance, on page 52, Dr. Corfield says that with *constant service* 'it is not necessary to have cisterns or receptacles of any kind for the storage of drinking water, although this is frequently done.' Now, as it is certain that the company's mains have occasionally to be emptied for repairs and other purposes, it is necessary to provide some cistern storage if we are not to be left without water altogether. We may remind our readers that by the Metropolitan Waterworks Act of July 1852, consumers are bound to provide a cistern when called upon by the company to do so; also that by the Act of August 1871, the company is not to be subject to any liability for not giving a constant supply if the want of such supply arises from frost, unusual drought, or other unavoidable cause or accident. So that a cistern is necessary even with a constant service of water, though the cistern need not be a large one.

On page 82 it is said that all attempts to ventilate sewers in any other manner than at the level of the streets have been without exception signal failures. This is an expression which we think might have been slightly modified with advantage.

On page 113, Dr. Corfield says that lead soil-pipes are to be preferred even outside a house 'because when iron ones are used it is usually necessary to put lead pieces in to receive the lead pipe from the closet to prevent a joint between lead and iron being made inside the house.' Now, Dr. Corfield will pardon us if we object to the word *necessary* in this connection. Closets are sent out with cast-iron traps (they are described in the work before us); what is simpler than to connect a cast-iron trap with a cast-iron soil-pipe by means of a proper cast-iron branch piece and bend with lead caulked and absolutely air-tight joints?

To return to the general disposition of the work, we find

that it is divided into six chapters, treating respectively of the situation and construction of houses, ventilation, lighting and warming, water supply, removal of refuse matter, sewerage, main sewers, and house branches, traps, ventilation, &c.; water-closets, sinks, and baths, arrangement of pipes, traps, &c.

In the chapter on water supply we see that the author agrees with other authorities in placing the average quantity of water required in a community, for all purposes, at 30 to 35 gallons per head daily. This contrasts strongly with the estimate of M. Wazon (*see* SANITARY RECORD, April 1885) who considers that for Paris about 200 gallons per head should be delivered daily. This large quantity is actually provided in Marseilles, and when the new aqueduct is completed a similar quantity will be delivered in New York.

The work before us is one that should be in the hands of every one connected with building, and in fact of every householder. The fact that it has so soon achieved a second edition testifies to its well-deserved popularity—a popularity which, we are glad to believe, is likely to increase rather than diminish.

London and Provincial Water Supplies: with the latest Statistics of Metropolitan and Provincial Water Works. By ARTHUR SILVERTHORNE, A.M.I.C.E. Pp. 141. London: Crosby Lockwood & Co. 1884.

WATER undertakings have lately been having a fair share (perhaps more than a fair share) of public attention. But there does not appear to be any disposition on the part of our legislators to look at the subject of water supply in its broad relations with the public welfare and the public purse. Mr. Silverthorne has done well therefore to follow up his previous book of 1881 on 'Purchase of Gas and Water Works,' by collecting together a mass of useful, interesting, and important information with regard to the districts, supply, revenue, rates, and the like of the water undertakings in nearly all the large towns of the United Kingdom. We do not, however, find in his book any comparative statistics such as would enable us to compare, let us say, the charges for water supply in one town with another. True, the admirably full and apparently exhaustive table as to each undertaking gives information of this kind in the particular form in which the water-rate is assessed in each place. But these are not reduced anywhere to a common denominator; so that it is difficult for example to say, without a calculation of one's own, whether an average house of 50*l.* rental, with a bath and water-closet, in the town of A, pays a water-rate higher or lower than a house of the same rental in the town of B. It would have been interesting, we think, to have compared the water charges in those towns still served by companies with the rates at towns like Liverpool and Manchester, where the water supply is a department of municipal responsibility—as it should be everywhere. Perhaps it is in connection with the purchase of water undertakings by corporations that Mr. Silverthorne is most practical and helpful. It is difficult to strike an average from the widely varying considerations that have been paid in different towns for acquiring the water supply; but, according to our author, 'where any success is expected to attend the transaction, nothing but the fair and honest value, as a going concern, must be paid.' Of the twenty-eight great towns whose mortality statistics are regularly published by the Registrar-General, seven are still supplied with water by private joint-stock companies. These are London (most important and most flagrant case of all), Sheffield, Newcastle, Bristol, Norwich, Portsmouth, and Sunderland. The last four of these appear to be very close corporations indeed, for no statistics with regard to them are given in the tables, and it must therefore be assumed that none are procurable. For the management of his figures Mr. Silverthorne must be accorded high praise; and if he leaves us to our own devices just when we are looking for teaching and guidance from him, he only follows the example of the majority of compilers of books on technical subjects.

House Sanitation. A General Survey for the Multitude, &c. By SEPTIMUS BEDFORD. W. Ridgway.

THE student of sanitary science has a library of valuable works to which he can refer. Douglas Galton, Baldwin Latham, Bailey Denton, Hellyer, Buchan, Davies, Dr. Corfield, and many others have supplied valuable textbooks for the professional reader, but there appears to be a real want of a cheap popular handbook on the subject. This want the author has endeavoured with considerable success to satisfy.

Mr. Bedford begins with a few simple remarks upon the selection of a site for a house, touches upon the relative advantages of different subsoils, and speaks of the necessity of ensuring dryness in the dwelling by using proper damp-proof courses and hollow walls. He then illustrates various kinds of traps and sinks, grease traps, closet traps, closets of different kinds, together with simple ways of disconnecting the feet of soil-pipes. Some clear information is given concerning the water supply of towns, and as to the use of waste-preventing fittings. A few pages of the pamphlet are devoted to the discussion of simple methods of ventilating ordinary dwellings, and an account is also given of the sanitary and insanitary houses at the Health Exhibition. The latter account may appear a little out of date, but it appears that the work before us was published last year. Of course in a work of this kind there can be nothing original; it aims only at being a fairly clear statement of the views of most of the leading authorities on the subject. It is illustrated with twenty-four woodcuts, and being published at one shilling it is likely to prove a useful and successful brochure.

Health and its Appliances. By DONALD NICOLL, Assoc. Inst. C.E. E. Duck, 12 Buckingham-street.

THIS work treats of Mr. Nicoll's 'Cloacina' system of disposing of sewage, which was illustrated at the Health Exhibition, and attracted some attention at the time. The author has felt very strongly the danger and disgrace of turning the raw sewage of four millions of people into the river to create an intolerable nuisance, when it might, in one form or another, be applied with the greatest advantage to suitable land.

Mr. Nicoll places an iron tank in a subway or cellar without each building in the town, to be drained, and directly under the footway. The drainage from the house falls into this tank, and after passing through two filtering layers, one of grit and one of charcoal, the liquid portion emerges at the bottom of the tank, to fall into a gully communicating with the ordinary public sewers, while the solids are retained. A manhole cover is provided in the pavement over each tank, and the dustmen and road scavengers are directed to place daily in each tank a portion of the refuse which they collect for the double purpose of assisting in the precipitation and defæcation of the solids. Vans containing clean tanks and provided with movable cranes will visit every house at regular intervals, and will raise up the partly-filled tank, replacing it with a clean one.

The contents of these tanks will be dried and converted into 'poudrette,' which the author has assured himself will prove of great commercial value as a manure. The effluent from the tanks he considers also will be perfectly innocuous.

The cellars and subways are to be ventilated into the street.

No one would wish to discredit a bold attempt of an engineer to grapple with a gigantic evil which the Metropolitan Board of Works has for years complacently declined to recognise, and which it is doubtful even now whether its officers are really prepared to deal with in a manner worthy of our present knowledge of the subject. This is hardly the place to enter into a lengthy criticism of the project before us, but we will name a few points to be considered in estimating the feasibility of applying a plan of this kind to a populous town.

They are the enormous expense of the subways, cellars

(for an ordinary cellar would not be at the proper level to receive the tank), manhole covers, tanks, vans, and apparatus, all of which our author does not attempt to estimate; the expense of maintenance, including collection of used tanks, drying of solid excreta, washing of filtering material, refilling the filtering chambers, and delivery of clean tanks. The offensive odours from the solids in the tanks which would have to remain in a putrefying condition for several days (relieved only by the occasional deliveries of ashes, &c., in the early morning) and which odours are conducted to the curb of the footway; the fact that the break in the line of drainage consequent upon the fixing of the tank would necessitate in most streets that the public sewers should be relaid at a much lower level.

There is also considerable evidence to show that the 'poudrette' would be of very little commercial value, and we doubt very much whether the effluent from the tanks would be anything like innocuous.

This work is not confined to the 'Cloacina' system of sewage treatment, but becomes most discursive, treating of dustbins, cisterns, ventilation, suggestions for amending the poor laws, land laws, cottages, tube wells, adulteration of food, lager beer for the million, and many other subjects of all kinds.

An account of the Sanitary House at the International Health Exhibition is extracted from the pages of the *SANITARY RECORD*, and a specification of the 'Cloacina' system, both in French and English, concludes the work. We can say but little in favour of the construction and execution of the work, which is most discursive. But it may interest some to know something of Mr. Nicoll's 'Cloacina' system, which would appear to have more chance of success in the country than in large towns.

Pocket Memoranda Relating to Infectious Zymotic Diseases. Arranged by MATTHEW ALGERNON ADAMS, F.R.C.S. London: J. & A. Churchill.

THIS card contains a wonderful amount of information about the zymotic diseases; first we have a series of heads of inquiry for investigating the source of contagion, then hints as to precautions against spread, by isolation, ventilation, and disinfection; next, on turning over the card, we find a very useful table showing the maximum, minimum, and average times of incubation, of fever before rash, of fever after rash appears, and of duration of infectivity after eruption. Under the latter head it may be said that twenty-one days is too short a time to allow for mumps, and fourteen quite short enough for German measles. The normal periods of latency, premonitory fever, duration of fever, and length of infectiveness of all the commoner acute specific diseases are also shown on a coloured chart. The card will be a useful addition to the pocket book.

NOTES ON BOOKS.

Sell's Dictionary of the World's Press. Henry Sell, 157 Fleet Street, E.C.

MR. SELL's annual, hitherto published as 'The Philosophy of Advertising and Newspaper Register,' is thoughtfully compiled, and very comprehensive. The home newspapers and periodicals appear under different headings; the number of the population of the places in which they are published being given. There is much useful information in the volume, amongst it being a list of the press agencies and associations, articles on the Copyright Act, Newspaper Libel Act, New Times and New Manners, Old and New Ways of Advertising, A Short History of the London Daily Press, &c., interesting alike to the general public and to advertisers, and particularly to those entering upon their noviciate in advertising. Mr. Sell is an advertising agent of large experience, and therefore a safe guide.

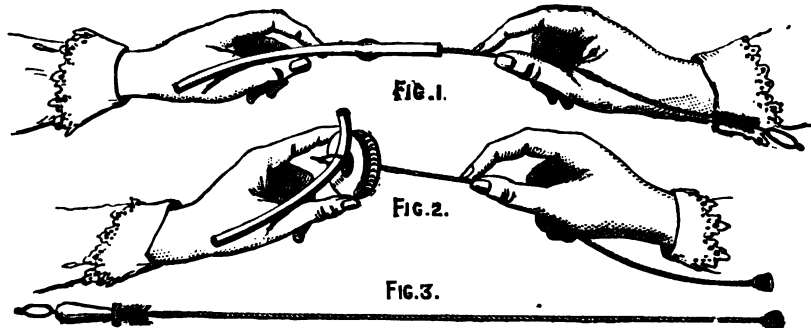
The Advertiser's Guardian. Louis Collins, Wine Office Court, Fleet Street, E.C.

'THE ADVERTISER'S GUARDIAN' is of similar character to Mr. Sell's compilation. It contains a large amount of matter intended to prove the advantages of advertising, which at the present day is perhaps scarcely required. A chapter is devoted to Australian and New Zealand and American advertising, useful to those who are interested in colonial trade. The list of papers, magazines, &c., although called 'siftings,' is extensive, and, besides prices and dates of publication, the date of their establishment is recorded.

NEW INVENTIONS.

THE PERFECT TUBE-CLEANER.

THERE can be no doubt that much of the infantile diarrhoea which swells the mortality rate is due to the accumulation of clots of sour milk and other impurities in the feeding-bottles, so constantly seen in the mouths of infants belonging to the poorer classes. The little tube-cleaner figured below, which is sold at an almost infinitesimal price by all chemists, is well calculated to remove this condition of things; and as the warm weather is *supposed* to be approaching we give publicity to this little invention, for the sake of the babes and sucklings. The woodcut will show how the tube-cleaner is used, and the directions appended will still further explain the matter.



DIRECTIONS FOR USE.

Remove the tube from the stopper, insert the cleaner (point end first) and draw completely through, as shown in fig. 1.

To replace tube in stopper pass the point through from the back, thread end of tube into loop, and pull it through, as shown in fig. 2.

* To clean the teat, pass the point of the cleaner through from the back as far as just over the loop, and turn the cotton brush round and round, as shown in fig. 3.

The patentees of the Perfect Tube-Cleaner are Messrs. Charles Richards & Co., of Seething Lane, E.C.

A NOVEL AMERICAN CLOSET.

THE w.c. apparatus which I propose to describe is the invention of Colonel Waring, a well-known American sanitary engineer, and I may as well say at once that I have not the remotest interest of any kind in the apparatus, nor have I any personal knowledge of its originator.

This closet appears to me to combine the advantages of a valve-closet with those of a good wash-out closet. In the valve-closet the use of a mechanical valve to close the outlet of the basin is very generally objected to for various reasons (which it is not necessary to dwell upon at present); but, on the other hand, it has the great advantage that the contents of the basin (say two gallons or more) are discharged with a powerful flush, which passes full-bore to

the soil-pipe, if the outgoing, &c., are of proper size. Now in the wash-out closet the mechanical valve is dispensed with, but the power of the discharge is comparatively feeble. The measure of the inlet of water is the measure of the discharge from the basin. If water is laid on with a $1\frac{1}{2}$ -inch pipe, the discharge can be only equal in amount. If this discharge enters a 4-inch drain-pipe, consider the small proportion that the sectional area of this stream bears to that of the drain-pipe itself—namely, that of $2\frac{1}{4}$ to 16. Instead of running nearly full-bore, the discharge from such a closet can only produce a small stream along the invert of the pipe.

Now if we examine the diagram of Colonel Waring's Dececo closet, we shall perceive that he has combined the advantages of the two closets which I have referred to by means of an ingenious adaptation of Mr. Rogers Field's flushing syphon.

All that portion of the apparatus which is above the floor is formed in a single piece of glazed earthenware. The remainder (or weir chamber) is made of cast iron, and in different forms, to accommodate it to various outlets. The reader will perceive that there are no joints, valves, or working parts to be disarranged.

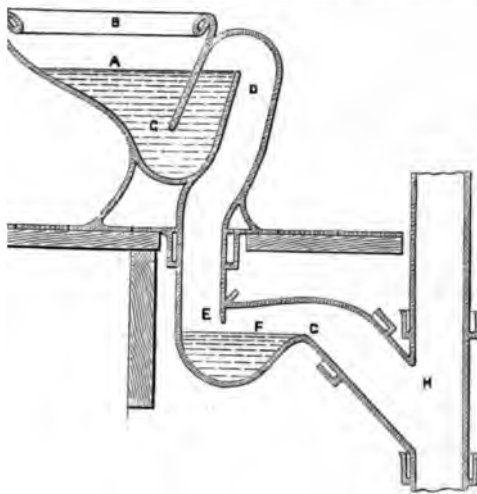
It will be understood at once that the bowl A is carefully proportioned to its proper shape. Its back is nearly vertical, to avoid soiling, and the trap is deep, though this depth is confined to the rear portion of the bowl, where deep water is required to receive faecal deposits, while the bowl is of very shallow depth towards the front. The only trap also is open to view in the bowl itself. If

it seems right, it is right. The water is supplied from a waste-not syphon cistern through the flushing-rim B. The bowl, &c., is finished, white glazed inside and out, and it is intended that it should stand always in a free and open space, the floor and walls being by preference finished with tiles, the only woodwork used being the seat itself, which is hinged to the back wall and rests upon two side-cleats.

If we examine its action it will be seen that the weir chamber F is in no sense a trap except during the operation of the discharge. It has a free air space, connecting the atmosphere of the soil-pipe with that of the outer limb of the syphon D. This weir chamber is ingeniously arranged, with a dip at E, so that when water is admitted to the bowl, and flowing over the syphon D raises the level of the water in the weir chamber, the dip is submerged and the syphon is s-aled. The stream of water continuing, the air is soon driven out of the syphon; and the whole volume of water contained in the deep bowl is drawn with great force over the syphon, and discharged into the soil-pipe until it has descended so low in the bowl as to admit air to the syphon at the intake C. Then the flow of the discharge ceases, though the supply of water to the apparatus is so arranged that it continues slowly to enter by the rim until the bowl is again replenished.

In the printed prospectus of this fitting, issued by the Drainage Construction Company, Newport, Rhode Island, we are told that it was invented in 1881, and that at least 200 of them have successfully been brought into use.

certainly appears to be an apparatus deserving of the careful consideration by all who are interested in the



A. Basin.
B. Flushing rim.
C. Intake of Syphon.
D. Long arm of Syphon.
E. Dip into Weir Chamber.
F. Weir Chamber.
G. Outgoing.
H. Soil Pipe.

et, and it is not perhaps surprising that the inventor ders it to be perfection itself.

appears to me that the apparatus may be objected being noisy. This is an objection that appears to be little heeded by sanitary engineers, but is certainly one of great importance to the ordinary householder. The ordinary syphon automatic supply cistern is a noisy though ingenious and thoroughly useful fitting, and has often to be replaced by other arrangements on account of this objection. The discharge flushing syphon must also be somewhat quiet when in action; and the two arrangements combined would, I fancy, produce sufficient noise to render the use of the water-closet in an ordinary London house unpleasantly obvious to all the family. The invention which has been devised so admirably a fitting will not soon overcome this objection, should it prove to be founded.

It only remains for me to state that the closet is patented in England, and to hope that this clever contrivance may soon have a practical trial here, as it appears to be theoretically to satisfy nearly every requirement that can fairly insist upon.

D. J. EBBETTS.

May 1, 1885.

A NEW READING STAND.

MRS. CORDEUX, SONS, & WERE, of Clifton, send us a little apparatus invented for the behoof of the solitary student who is addicted to the bad habit of reading during meals. The arrangement consists of a wire frame, intended to support newspapers, magazines, and books, fixed on a sufficiently heavy to ensure stability even if the stand is placed at the extreme edge of a table. A wire cord with a weight at the left side is so arranged as to lie over the margin of a book and keep the leaves open. The right side of the wire cord being lighter is easily raised by the leaf in turning over, and thus only one hand need be used. The weight can, however, be moved on the cord if desired. The upper surface of the base is covered with Utrecht velvet, which prevents the newspaper or book from slipping. The wire frame is also made to fold flat for convenience of packing, and to slope back so as to be adapted for various sizes of books. The stand,

besides the use already indicated, is further eminently useful for supporting music, drawings, documents, &c., while being read or copied.

The price of this convenient little invention is very moderate, being from one shilling and sixpence upwards, according to design and finish.

A NEW LETTER-CLIP.

As a convenient adjunct to the writing-table, Iles's Spiral-Clip may be recommended to literary and business people who receive many letters. The clip consists of a coil of spiral wire fastened on to wooden frames of various sizes and shapes, according to price. The one figured below, the Rainbow Clip, in which the spiral is fixed to a neat ebonised frame, is sold retail for the 'splendid shilling,' and will hold a considerable number of letters, answered, unanswered, or for the post. Other forms of the same idea, such as the 'Castle,' hold a larger number of letters and memoranda, and cost rather more money.

All these clips, however, are neat, efficient, and remarkably cheap. This desideratum is, the inventor informs us,



obtained by the use of various ingenious labour-saving machines devised for the manufacture of these useful little clips. The inventor is Mr. J. Iles, of the firm of Iles Brothers, Unity Works, Highgate Street, Birmingham.

CORRESPONDENCE.

Audi alteram partem.

[All communications must bear the signature of the writer not necessarily for publication.]

VENTILATION.

MR. WALTER HENRY DRAKE, in the *SANITARY RECORD* of April 15, page 485, writing on the above-named subject, has apparently only selected the title he has adopted as affording him an opportunity of attacking the system of ventilation of which I am the inventor and patentee. With reference to Mr. W. H. Drake's visit to my test-room, the truth of all my statements can be tested *die in diem* by personal inspection, and have been verified time after time by numbers of scientific men, who have not hesitated to record their opinions of my arrangements in a visitors' book for that purpose. Mr. W. H. Drake's visit to my test-room I am informed only lasted ten minutes, the greater part of which was spent arguing with my representative and another gentleman upon the efflux of vitiated air up tubes of certain diameters, under varying atmospheric conditions. Mr. W. H. Drake endeavoured to comprehend in five to seven minutes a system that eminent architects, engineers, and members of the medical profession have spent hours in testing and investigating. In his description of the drawings he is entirely at sea; he says, 'it will be seen that the air introduced by the "fresh-air inlet" strikes against a plate and is supposed to separate, part ascending to the outlet, the remainder taking, for some unknown reason, the contrary direction.' As a fact, the air is not supposed to separate, neither does part of it, for some unknown

reason, take a contrary direction; it is deflected and circulates where it is expected to circulate, and finds its exit where it was always intended it should. He then goes on to say that 'the air in the exhaust will simply be describing circles, the top of the exhaust being open, and little or none will even find its way out.' To show your readers the very perfunctory character of this gentleman's knowledge of my system, and the value of his personal inspection, I may inform you that there is an arrangement in my apparatus that prevents the very rotary motion on which he descants. And as regards the non-escape of the vitiated air, he would have proved the fallacy of his statement had he gone on to the roof, as the more conscientious investigators have done. Mr. Barnes Austin informs me that he told Mr. W. H. Drake he attached no importance to anemometrical tests in testing ventilators, but used one to demonstrate to visitors that there was no down-draught, and for this purpose an anemometer is invaluable. Mr. Barnes Austin and the other gentleman deny *in toto* using the anemometer as illustrating the excellent working of my system, other than for the reason above mentioned. The next query propounded by Mr. Drake is, 'Why does the anemometer remain motionless when on the line with the ceiling in the exhaust?' This query is badly worded, it is putting the cart before the horse. If the anemometer were to revolve on the ceiling-line it would demonstrate a sentient draught. In all human probability, if I had a few Tobin's tubes round the room, I should create a perceptible current; I wish to, and do ventilate with an insentient one.

He then goes on to ask, 'Secondly, why does the anemometer remain motionless until above what in the section is termed the "fresh air channel?"' For the same reason that anyone walking from one field into another under a bridge will be conscious of a draught, which he did not feel when out in the open. If Mr. W. H. Drake requires a practical demonstration of the fact, let him put his eye to the keyhole of his front door. If an open pipe were placed in my room, or same was capped with an Aldous ventilator under similar conditions, I have no doubt a perceptible draught of air upwards would be felt below the outlet-pipe on ceiling-line. With my aspirator it is not felt, although ventilation is always going on. Mr. W. H. Drake unintentionally proves my case, that there is no down-draught in my aspirator, when he asks how it is that the anemometer revolves when above the 'fresh air channel.' The third query, 'What is the reason of the anemometer revolving at such an increased rate when near the sides of the exhaust?' My answer is, after six months' daily experiments, that the anemometer works the same wherever it may be placed in the tube. If Mr. W. H. Drake will only exercise the brains with which Heaven has endowed him, he may be able to inform us 'that, given two circular plates with an annular space of one inch between them, arranged as they are in the construction of my aspirator,' the exact pressure and velocity of air on every inch of the square of same 144" that will pass into the outlet tube. I very much question if an anemometer held in the very centre of an outlet tube, say 2 feet in diameter, capped with Mr. Edgar Aldous's ventilator, would record any movement at all, centre or sides, as mine does. I wish it to be distinctly understood I demur to Mr. W. H. Drake's inference that to secure a movement of the anemometer it requires to be placed at the sides of the exhaust, for that is what he is seeking to prove. I will briefly refer to the two remaining paragraphs requiring notice in this letter. He asks what is the meaning of the following passage: 'Syphonic action is at work constantly, regulated by the requirements of the room.' After this follow some remarks about miraculous means of bringing in air, each person being supposed to bring in sufficient for his own requirements, &c. The syphonic action I mean is, *that as fast as the impure air is carried off, the fresh air is syphoned in through the fresh air inlets to take its place.*

To the final paragraph, 'The air had as vitiated and exhausted a feel as in the most stuffy and unventilated drawing-room,' I forbear to attach the proper words I ought to apply to the statement. I will merely say the five gaseliers were only lighted some four to five minutes on the occasion of Mr. W. H. Drake's visit. On other occasions I have had them alight with a coke fire burning at same time, eight and ten hours at a stretch. Even then it was remarked how thoroughly free from unpleasantness of any kind was the atmosphere. On no occasion of visitors coming were the gasaliers kept alight so short a time as they were during the visit of Mr. W. H. Drake. If after eight hours burning of gasaliers, &c., under such conditions, Mr. W. H. Drake had been the first and only one out of the number of visitors to my test-room to complain of the atmosphere therein, when the gasaliers were not alight as many minutes as they had been hours on other occasions, surely his statement, requires to be taken *cum multis granis salis*.
FREDK. H. SMITH.

52 Queen Victoria Street, E.C.

May 1, 1885.

In the April number of the SANITARY RECORD, p. 485, here appears a letter, signed by Mr. W. H. Drake, so antagonistic to the system of ventilation invented and patented by Mr. Fred. Henry Smith, of 52 Queen Victoria Street, E.C., and to your notice of it in a previous number, that I claim the right, as that gentleman has mentioned my name in connection with a visit he recently paid to the test-room of said system, when I received him, to reply to his statements. Before I proceed to discuss Mr. Walter Henry Drake's criticisms, permit me to refer to one fact, viz. that Colonel Sir Francis Bolton, C.E.—who certainly knows a good invention when he sees it—permitted Mr. Smith to ventilate the Island Room under the Fountains, at the Healtheries on his system. At this exhibition, ventilating engineers known to fame, gold medallists, &c., were there in scores, and yet a comparatively unknown man's system of ventilation was selected for trial. Why? because Colonel Bolton saw it had in it the elements of success, and the result proved the acumen and correctness of his judgment. I venture to say there was no other system exhibited at the Healtheries that could have been successfully applied for the ventilation of the Island Room, considering the abnormal conditions it presented, when Mr. Fred. H. Smith first took it in hand. Despite all this, Mr. W. H. Drake, in his enthusiastic, but indiscreet, eulogy of Mr. Edgar Aldous's System of Ventilation has allowed his feelings of partisanship to shipwreck his judgment, when men of mark in the professions, and experts sent by the *Times*, *Architect*, *Building News*, *Iron*, *Local Government Chronicle* are (after a personal inspection of the test-room) unanimously of opinion that the system which Mr. Drake condemns is one that fulfils all that is claimed for it by the inventor.

R. BARNES AUSTIN.

Heathfield, East Moulsey.

April 28, 1885.

THE VENTILATION OF HOUSE DRAINS.

I cannot see anything new in Messrs. Sharp & Co.'s illustrated paper on this subject. My model of a London House showed it plainly in the last Health Exhibition. The soil-pipe was a 'down-cast,' and had a small 'up-cast' ventilating pipe of its own, with a Howorth's rotating cowl at the top, to insure its working. There was another up-cast pipe with a similar cowl, running up the front of the house with a down-cast fresh air pipe communicating with the drain system in the back yard. Although the jury did not seem to have taken much notice of the model, I know for a fact that its exhibition was not without good, as many houses have had their drains looked to, and many drains have been ventilated in consequence.

Torquay, April 25.

J. R. TURNBULL,
Lieut.-Colonel.

LAW REPORTS.

BACTERIA IN MILK.

How v. Piffards.

THE plaintiff, a dairyman, at Hemel Hempstead, sought to recover damages from the defendant, a gentleman resident in the same place, for libel contained in communications written by him to the local authorities and the local press, reflecting on the quality of the milk which the plaintiff served to the public, and so injuring him in his business. The defendant did not deny that he wrote and published the communications, but pleaded that they were written bona fide on a matter of public interest and were privileged.

What the defendant had alleged was that the plaintiff's milk contained impurities calculated to give the consumers typhoid fever. His own daughter had suffered from typhoid fever, and he attributed this to the milk supplied by the plaintiff to his family. He had some of the milk subjected to microscopic examination, and asserted that it was contaminated with bacteria. The milk was also examined by Dr. Saunders, the medical officer of health, and this gentleman pronounced it to be sound. The defendant, however, had medical evidence to show that the milk contained the living organisms called bacteria, and bore testimony himself to their lively action under the microscope as they 'moved about with their tails.' Dr. Mellor, who had microscopically examined a sample of the milk for the defendant, and against whom the plaintiff had brought an action in connection with the same matter, said that this sample contained bacteria in the form of the true germ of putrefactive decomposition, but not the germ of typhoid fever, which had never been seen. He had never told the defendant that the sample contained the germ of typhoid fever. In his cross-examination he referred to the organisms in their earlier life as 'the babies' of bacteria. Mr. Jarvis asked whether a baby bacterium was as dangerous as an old one. The witness replied that it showed that the process of putrefaction had begun.

The result was the jury found that one of the alleged libels was privileged, and as to the others they found for the plaintiff. Damages for two of them, £10; for one of them 40s.; and for two others, 12s. each.

ADULTERATION OF MILK.

Mr. C. A. Carter, from the Town Clerk's Office of Birmingham, appeared in support of the following case against Thomas Knight, farmer, of Kingswood, who had consigned ten gallons of milk to John Bevan, a milk seller, residing in Nel-on Street West. Mr. Carter explained to the magistrates that the milk in question had been taken while in course of delivery at Snow Hill Station by Mr. John Parker, the inspector of nuisances and inspector under the Food and Drugs Act, and in accordance with sect. 3 of the Sale of Food and Drugs Act Amendment Act, 1879. Mr. Parker proved taking the sample, and duly handing the same to Dr. Hill, the borough analyst, whose certificate showed that 16 per cent. of water had been added.

CANAL BOATS ACT (1877).

At the Birmingham Police-court the following persons were summoned by Mr. John Parker, inspector of nuisances and inspector under the Canal Boats Act, 1877 and 1884:—Thomas Ward, Stroud, near Gloucester, for using the boat *Garibaldi*, on the Birmingham and Worcester Canal, in contravention of the Act, the boat being in a filthy condition. The defendant was fined 10s. and 9s. 6d. costs. A like case was proved against Ambrose Webb, of Rudge, owner of the boat *Snowdrop*; he was fined 5s. and 1s. 6d. costs.

Nathan Buckler, owner, was fined 10s. and 11s. costs, and Thos. Proctor, the master, was fined 2s. 6d. and 11s.

costs, for using as a dwelling a canal boat which had not been duly registered.

SKIMMED MILK.

At Worship Street, several summonses under the Adulteration Act against tradesmen of Shoreditch parish were for hearing by Mr. Barstow, at the instance of the local vestry, represented by Mr. Walker, clerk. An important question was raised as to the operation of the 6th and 9th sections of the Adulteration Act. The summonses alleged the distinct offence, under the 9th section, of having sold milk from which butter fat had been abstracted. The section provides that the milk in question—known popularly as 'skimmed milk'—shall not be sold to the prejudice of the purchaser without a declaration of its altered state. A case had once been heard before Mr. Sheil, but inasmuch as the summons was then taken under the 6th section, which refers to adulteration, the magistrate dismissed the summons. The Court of Queen's Bench upheld that decision, adding that if there was any offence at all it must be under the 9th section, although the judges refrained from expressing an opinion as to the powers of that latter section. On behalf of the vestry, it was now contended that the skimmed milk sold was not 'milk' of the quality contemplated by the Act. The solicitors for the defendants submitted that the article sold was the milk of commerce, and was naturally somewhat deficient in fat. Evidence intended to prove the cases was called, and the certificates of an analyst were produced, indicating the deficiencies complained of. Mr. Ricketts, for the defence, objected, successfully, against the production of a copy of a card left by the inspector at the shops, the magistrate ruling that the original document should be produced. One summons was dismissed on account of the wrong date being inserted in the summons. Upon another the defence set up was that the case could not be brought within the 9th section. The words of the statute clearly indicated that the Legislature had provided for an offence of the kind under consideration only in the event of proof being given, either that the seller himself made the abstraction or that he had the knowledge of abstraction which he might make a declaration about. No seller of milk could disclose to a customer an alteration in its quality of which he was not aware. Beyond this, the principal objection, it was pointed out that in the prosecution no evidence was given that the sellers were told by the inspector that the milk was for public analysis, as set down in Section 14, the officer merely using the words 'for analysing.' Mr. Walker said the points raised were important as affecting the public, and the solicitors defending said the matter was quite as important for the trade. This was the first time that a case had been taken under the 9th section, it having been thought that an expression of opinion in the Court of Queen's Bench justified the parish in the course they were taking. Mr. Barstow said he had not particularly noticed the 9th section until his attention was called to it, and having read it he certainly agreed with the defence that the section contemplated that the seller must have abstracted some essential part of the article or must have knowledge of its alteration. The summons then before him must be dismissed. The other summonses were abandoned.

SANITARY JOTTINGS.

PNEUMONIA has been unusually prevalent in nearly all the large American cities, and peculiarly fatal.

An American plumber has suggested the manufacture of lead-lined soil-pipe.

New State Boards of Health have been created in Kansas, Maine and Dakota.

At St. Albans, Vt., a cat and a dog died from scarlet fever contracted from a sick child.

Italy appears to be waking up to the necessity of housing her population in a proper sanitary fashion. The Communal Council of Foggia has resolved on offering a premium of 100,000 lire (4,000*l.*) to any society which will undertake the construction of dwelling-houses in that city to the amount in value of 1,200,000 lire. The houses are to consist of a ground floor and two upper stories, and certain other conditions are to be complied with.

Newcastle still continues to exhibit an excessively high death-rate, that for the week ending May 2 showing an average of 34 in the 1,000, that of the preceding weeks being somewhat higher. This great mortality is attributable in no small degree to a virulent epidemic of measles, which has swept off a large number of children. The medical officer of health and his staff have been most energetic in their efforts to stamp out the disease, but in many cases have found their labours neutralised by the gross ignorance or culpable neglect of parents, who personally show little regard for the safety of their children, but afford every facility for the spread of the disease, by allowing them to visit and mingle with their sick neighbours. In Sunderland the disease has greatly abated, thanks to the strenuous efforts of the sanitary authorities.

Owing to the great prevalence of measles and the excessive mortality resulting therefrom, the Corporation of Jarrow-on-Tyne, acting on the advice of their medical officer, Dr. Munroe, have recommended that all public and private elementary day and Sunday schools be closed after the 1st inst. until the committee see fit to remove the restriction, the committee being empowered to make the revocation order when it is deemed advisable.

At an inquest recently held at Durham, on the body of a man who had died suddenly on his way to the railway station, the Coroner said it was a disgrace to the city that no mortuary existed there, the body having to lie at the ticket office till claimed. The foreman of the jury, who was a member of the Corporation, said that the authority 'contemplated' providing a mortuary, when the Coroner rejoined more pithily than elegantly, that he would believe it when he saw it. It is evident that needful sanitary improvements are not adopted with desirable alacrity in Durham.

Complaints have been made of the want of a good model lodging-house for tramps at Darlington, which, being situated on the great North road, is much frequented by that fraternity. It has been proved that much of the infectious disease prevalent in that town was brought by these humble travellers, who introduced it into the various lodging-houses now scattered about Darlington, over which it is found somewhat difficult to exercise the necessary strict supervision.

At the last meeting of the Gateshead Town Council much regret was expressed at the continued high death-rate of the borough, which last month averaged 24.6 per 1,000. The authorities have been most energetic in their efforts to remove all causes which have a tendency to produce excessive mortality, but so far the result does not seem commensurate with their labours.

Apparently the Local Board of Stroud do not recognise anything improper or uncommon in the existence of a number of pigsties within 150 yards from the well supplying the town with water. The general feeling of the Board appears to be reflected by the remark of one member that 'if the water was regularly tested, and was at any time found to be polluted by the pigsties, that would be the time to stop them.'

WATER SUPPLY.

The Hexham Rural Sanitary Authority have signed an agreement which will enable them to provide a good supply of water from the Shaw Well, for the use of the inhabitants of the neighbouring township of Corbridge. The Parochial Committee of that place have also been directed to preserve to the village the water supply from Spout Well. These arrangements have tended to allay the anxiety which has long been felt as to the quality and sufficiency of the water supply.

THE HOUSING OF THE WORKING CLASSES.

*How best to help the slender store,
How mend the dwellings of the poor?*

WORKMEN'S DWELLINGS IN EAST STONEHOUSE.—We are glad to learn that within a very few months a large and substantial block of artisans' dwellings has sprung up in Stonehouse, where overcrowding prevails to a great extent, and will in a short time be ready for occupation. The dwellings, which consist of twenty-four apartments, of two rooms each (*i.e.* accommodation for twenty-four families) are contained in one block of buildings four stories in height. Each floor contains twelve rooms, and as all are precisely similar in arrangement the description of one will suffice for all. The central portion of each floor contains a stone staircase; landing at each storey on an open stone balcony, and immediately behind this staircase is a washhouse with copper furnace, and a range of fixed washing trays, with cold water laid on to each, with proper wastes discharging into an open iron trough gutter underneath. The water-closets for each floor are situated on each side of the washhouse, and enter from lobbies off the stair landing. On one side are two water-closets for women and children, and on the other side a water-closet and urinal for men, each side being entirely distinct as to the approaches. On each side of the central staircase and balcony a corridor branches off, giving access to three apartments in each wing of the building, and at the ends of these corridors are large windows, with the upper portions filled in with fixed louvres. The bedrooms are all situated on the sides of the corridors opposite to the living rooms, and in no case is there direct communication between bedrooms and living rooms. Each living room is fitted with a small cooking range with oven, and the bedrooms with ordinary mantel register grates. Each room has also a cupboard ventilated by air bricks, and in the living rooms the lower parts of the cupboards are fitted up as coal hutchies. In the floor from each room, close under the ceiling, is fixed a 'Boyle's Mica Flap Ventilator.' The water-closets are all fitted up with pans and traps on the wash-out principle, and are connected on the outside of the building with stacks of galvanised iron soil-pipes, which are carried up at the top about 3 feet above the eaves gutter, and at bottom discharge into an 'intercepting trap' with an air shaft, so as to secure a constant circulation of fresh air through the soil-pipes. All the waste-pipes from washhouses and sinks are carried down in separate stacks of galvanised iron pipe, which discharge over gratings of large trapped yard gullies. The water supply is from two large galvanised iron cisterns in the roof over the central staircase, one cistern being entirely reserved for the supply of the flushing cisterns of the water-closets, and the other being for washing and drinking purposes. The water for drinking is laid on to a separate sink in each washhouse, and waste from same is carried to the iron waste-pipes previously mentioned. The rooms have an area of about 120 superficial feet, and none are less than 8 feet 6 inches in height, the lower stories being about 10 feet. The whole of the corridors, washhouses, water-closets, lobbies, &c., have fireproof floors formed of Portland cement concrete on iron bearers, and are trowelled off to a smooth surface in neat cement. The balconies and staircases are all of York stone. The building is set back about 12 feet from the street, and has an open space, exclusively belonging to it, on every side. The scheme has been carried out by the Earl of Mount Edgcumbe and three other gentlemen as a private enterprise, and in the hope that decent and sanitary dwellings can be provided at a cost that will ensure a moderate return for the outlay. If this can be proved, no doubt the example will be followed by the erection of other similar dwellings, of which there is great need in the locality. The total cost, exclusive of site, is somewhat over 3,000*l.*

PARKS AND OPEN SPACES.

Almighty first planted a garden, and indeed it is the parent of all pleasures.

At the last meeting of the St. Giles's District Board of Health, it was resolved to spend a sum of £200 in planting trees along such portion of the new street (from New Street to Piccadilly), as is within the jurisdiction of the Board.

At the 4th instant the inhabitants of Bethnal Green and the End Old Town were honoured with a visit from the Marquis de Louvois, who, accompanied by the Marquis de la Fayette, went down to open two gardens which had been reserved for the use and enjoyment of the public. At five o'clock the distinguished visitors arrived in Carlton Square, and alighted at a pleasant enclosure near the Globe Road, where they were met by Lord Brabazon, the Bishop of Bedford, William Vincent, the Rev. J. F. Kitto, and other representatives of the association. The ceremony was an interesting one, and the appearance of the gardens was enhanced by the presence of a corps of the Tower Hamlets, under the command of Lieutenant Kirby. Lord Brabazon explained the manner in which the association had gained possession of the ground, and how the execution of its conversion into a public garden had been effected by one lady. At the close of the ceremony the visitors drove to the disused burial-ground of St. Barnabas's, Bethnal Green, also laid out as a garden by the association with the permission of the vicar, the Rev. MacGachen. The Princess graciously declared the garden open to the public, and expressed herself very pleased with its appearance. At both places the visitors were enthusiastically received; the surrounding streets thronged with the people of the neighbourhood, and with bunting and flags, crowds of heads were to be seen at all the windows, and ringing cheers greeted those who had so kindly paid a visit to the East End, and who represented the beneficent association.

NOTICES OF MEETINGS.

METROPOLITAN PUBLIC GARDEN ASSOCIATION.

A meeting of this Association was held on May 5, at 83 Lancaster Road, Brabazon in the chair. The Secretary announced that a plan of roof had been given by the Skinners' Company, and £2 by the City of London. Viscount de Vesci, Lord Brabazon, Sir William Vincent, Mr. J. T. Bedford, and Colonel Mordaunt were elected vice-chairmen of the Association, and Miss I. M. Mordaunt was elected honorary secretary. It was reported that the garden of St. Paul's, Rotherhithe, had been opened the previous day by the Princess Louise, that the improvement of Trafalgar-square, Mile end, Wilton and Northampton-squares, Clerkenwell, and the ground reserved to St. Paul's, Rotherhithe, were being proceeded with, and the conversion into open gardens of Red Lion square, the East London cemetery and the churchyards of St. Peter, Walworth, and St. Bernard, would be commenced shortly. The secretary announced that the owners of Nelson-square, S.E., the triangle between the garden of St. Paul's, Rotherhithe-square, certain streets in New Kent-road, and of even disused burial-grounds had agreed to allow their grounds to be thrown open to the public. At the meeting other important questions considered at the meeting were proposed river recreation grounds in the Isle of Dogs and at the appropriation of part of the sites of the Houses of Commons as open spaces, the throwing open of Stepney churchyard, the proposed boulevard on the Main Drainage Embankment. A resolution was passed upon the payment of the 'unemployed,' over whom are now at work in the various gardens which are laid out by the Association.

EXAMINATION FOR LOCAL SURVEYORS AND INSPECTORS OF NUISANCES.

The Sanitary Institute of Great Britain will hold its next examination for Local Surveyors and Inspectors of Nuisances on Thursday May, June 4 and 5, at the Parkes Museum, 74A Margaret Street, W. E. WHITE WALLIS, Secretary.

APPOINTMENTS.

MEDICAL OFFICERS OF HEALTH.

- ABBOTT, Charles Edward, L.R.C.P. Edin., and L.M., M.R.C.S. Eng., has been re-appointed Medical Officer of Health for the Braintree Rural Sanitary District, at £150 for one year.
- ALLEN, James, L.R.C.P. Edin., and L.M., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Bollington Urban Sanitary District, at £20 for one year.
- ANGOVE, Edward Scudamore, L.R.C.P. Edin., and L.M., M.R.C.S. Eng., and L.M., has been re-appointed Medical Officer of Health for the Camborne Urban Sanitary District, at £50 for one year.
- BAILLY, Thomas Ridley, M.B., C.M. Univ. Edin., has been appointed Medical Officer of Health for the Bilston Urban Sanitary District, at £50 per annum, *vice* Gilbert, deceased.
- CHESTERMAN, Walter Henry, M.D. Univ. Durh., M.R.C.S. Eng., has been re-appointed Medical Officer of Health for the Guiseley Urban Sanitary District, at £15 for one year.
- CLARK, William Thomas Marston, L.R.C.P. Lond., M.R.C.S. Eng., has been re-appointed Medical Officer of Health for the Twickenham Urban Sanitary District, at £10 for one year.
- COKE, Wm. Harriott, L.R.C.P. Lond., M.R.C.S. Eng., has been re-appointed Medical Officer of Health for the Ashford Urban Sanitary District, at £30 for one year.
- DAVIES, David W., M.D., has been appointed Medical Officer of Health for the Llanharan division of the Bridgend and Cowbridge Rural Sanitary District, at £10 for one year.
- DAVIES, Howard, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Pontypridd Urban Sanitary District, at £16 per annum, *vice* Hopkins, deceased.
- DAVIES, John, M.D. Univ. Glasg., has been appointed Medical Officer of Health for the Maesteg Division of the Bridgend and Cowbridge Rural Sanitary District, at £12 for one year.
- DAVIS, Evan Thomas, L.R.C.P. Edin., and L.M., L.F.P.S. Glasg., has been appointed Medical Officer of Health for the Cowbridge Division of the Bridgend and Cowbridge Rural Sanitary District, at £22 for one year.
- FORSYTH, Robert, M.D. Univ. Glasg., has been appointed Medical Officer of Health for the Birstall Urban Sanitary District, Yorkshire, at £25 for one year.
- HARPER, John William, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Stowmarket Urban Sanitary District, at £10 for one year.
- HASWELL, Narcis Richard, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Helston Rural Sanitary District, at £50 for six months, ending Michaelmas next.
- HEATH, Henry Thomas, L.R.C.P. Edin., L.R.C.S. Irel., L.A.H. Dub., has been re-appointed Medical Officer of Health for the Mansfield-Woodhouse Urban Sanitary District, at £52 for one year.
- HOLLAND, Henry Frederick, M.D. Univ. St. And., M.R.C.S. Eng., and L.M., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Amphil Rural Sanitary District, at 50 guineas for one year.
- HOSGOOD, William, M.B., C.M. Univ. Edin., has been appointed Medical Officer of Health for the Cannock Rural Sanitary District, at £50 per annum, *vice* Taylor, whose appointment has expired.
- JAMES, Philip, L.R.C.P. Edin., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Western Division of the Bridgend and Cowbridge Rural Sanitary District, at £30 for one year.
- JONES, William Makeig, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Swinton Urban Sanitary District, Yorkshire, at £4 for one year.
- JOYCE, William, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Ashby-de-la Zouch Urban Sanitary District, at £10 for one year.
- LOWE, John, L.R.C.P. Edin., and L.M., L.R.C.S. Irel., has been re-appointed Medical Officer of Health for the Workington Urban Sanitary District, at £60 for one year.
- RANDALL, Wyndham, L.R.C.P. Edin., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Bridgend Division of the Bridgend and Cowbridge Rural Sanitary District, at £35 for one year.
- ROBERTS, Arthur, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Bingley Urban Sanitary District, at £40 for one year.
- ROCH, Sampson, M.R.C.S. Eng., Deputy Surgeon-General, Army, on the Retired List, has been re-appointed Medical Officer of Health for the Cheltenham Urban Sanitary District, at £300 for one year.
- ROSE, Frederick Robert, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Diss Urban Sanitary District, for one year.
- STONEV, Percy Butler, L.R.C.P. Edin., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Millom Urban Sanitary District, Cumberland, at £40 for one year, from the 7th instant.
- THOMAS, David John, L.R.C.P. Edin., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Ogmere Division of the Bridgend and Cowbridge Rural Sanitary District, at £15 for one year.
- WALKER, John Davidson, L.R.C.P. Edin., L.R.C.S. Edin., has been re-appointed Medical Officer of Health for the Fyde Rural Sanitary District, at £60 for one year.

- WILKINSON, George Frederick Eachus, L.R.C.P. Edin., L.S.A. Lond., has been appointed additional Medical Officer of Health for the Lewisham District, at £100 per annum.
- WILLIAMS, Augustus Frederick L.F.P.S. Glasg., and L.M., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Brixworth Rural Sanitary District, at £5 5s. and fees for one year.
- WILLIAMS, Robert, M.B., C.M. Univ. Edin., has been re-appointed Medical Officer of Health for the Leominster Urban Sanitary District, at £30 for one year.
- YARROW, George Eugene, M.D., L.R.C.P. Lond., has been appointed Medical Officer of Health for the Parish of St. Luke, Middlesex, at £150 per annum, *vice* Pavy, resigned.

SURVEYORS, CLERKS TO GUARDIANS, INSPECTORS OF NUISANCES, &c.

- ADDIS, Mr. Henry Arthur, has been re-appointed Clerk to the Usk Local Board and Urban Sanitary Authority, at £20 for one year.
- ALGER, Mr. James, has been re-appointed Surveyor, Inspector of Nuisances, and Collector to the Diss Local Board and Urban Sanitary Authority for one year.
- BAKER, Mr. John, has been appointed Inspector of Nuisances and Assistant Surveyor for the Walton-on-the-Hill Urban Sanitary District, at £100 per annum.
- BATY, Mr. John George, has been appointed Clerk to the Houghton-le-Spring Guardians and Rural Sanitary Authority, at £100 per annum as Clerk to the Guardians, £65 per annum as Clerk to the Rural Sanitary Authority, £35 per annum as Clerk to the Assessment Committee, such remuneration as Clerk to the School Attendance Committee, as may be fixed annually, and fees as Superintendent Registrar of Births, &c., and Returning Officer, *vice* Legge, deceased.
- BELLAMY, Mr. James William, has been re-appointed Clerk and Surveyor to the Rawmarsh Local Board and Urban Sanitary Authority, at £120 for one year.
- BITHELL, Mr. W. E., has been re-appointed Inspector of Nuisances for the Flint Urban Sanitary District, for two years.
- BOWLER, Mr. John, has been re-appointed Surveyor and Inspector of Nuisances to the Mansfield-Woodhouse Local Board and Urban Sanitary Authority, at £50 for one year.
- BRETT, Mr. Frederick, has been appointed Inspector of Nuisances for the Stowmarket Urban Sanitary district, at £12 for one year.
- BURGESS, Mr. Charles, Inspector of Nuisances for the Burslem Urban Sanitary district, has been appointed an Inspector under the Canal Boats Act.
- CHRISTIE, Mr. Henry Francis (the Surveyor), has been re-appointed Inspector of Nuisances for the Maldon Urban Sanitary District, at £20 for one year.
- CLARIDGE, Mr. William Palmer, has been re-appointed Inspector of Nuisances for the Loughborough Urban Sanitary district, at £90 per annum.
- COCKER, Mr. James H., has been appointed Inspector of Nuisances for the East Medene Division of the Isle of Wight Rural Sanitary District, at £125 per annum, *vice* Bartlett, appointed Surveyor of Highways and Inspector of Nuisances for the Wilton Rural Sanitary District.
- COOMBS, Mr. Henry, has been re-appointed Inspector of Nuisances for the Stratford-on-Avon Rural Sanitary District, at £90 for one year.
- DIBBS, Mr. Thomas, has been elected Member for the Cottingley Ward of the Bingley Local Board and Urban Sanitary Authority, *vice* Laycock, deceased.
- DRABBLE, Mr. John Edward, has been re-appointed Treasurer to the Swinton Local Board and Urban Sanitary Authority, Yorkshire, for one year.
- EASTON, Mr. Charles I., has been appointed Inspector of Nuisances for the Tottenham Urban Sanitary District, at £150 per annum, *vice* Poulson, resigned.
- EDDYVEAN, Mr. Robert Philipps, Solicitor, has been appointed Town Clerk and Clerk to the Urban Sanitary Authority of Bodmin, at £80 per annum, *vice* Wallis, whose appointment has expired.
- GILBY, Mr. Richard Henry, has been re-appointed Inspector of Nuisances for the Brixworth Rural Sanitary District, at £90 for one year.
- GRIGGS, Mr. Benjamin, Branch Manager of the London and County Banking Company, has been appointed Treasurer to the Corporation and Urban Sanitary Authority of Reigate, *vice* Stenning, resigned.
- HALL, Mr. Hawksley, has been re-appointed Treasurer to the Mansfield-Woodhouse Local Board and Urban Sanitary Authority, for one year.
- HALLER, Mr. James Cracroft, has been re-appointed Surveyor and Inspector of Nuisances to the Swinton Local Board and Urban Sanitary Authority, at £45 and £80 for one year.
- HARROP, Mr. Frederick Lee, Solicitor, has been re-appointed Clerk to the Swinton Local Board and Urban Sanitary Authority for one year.
- HILL, Mr. Joseph, has been re-appointed Surveyor and Inspector of Nuisances to the Bollington Local Board and Urban Sanitary Authority, at £57 for one year.
- HUMPHRIES, Mr. Josiah, Branch Manager of the London and Provincial Bank, has been re-appointed Treasurer to the Diss Local Board and Urban Sanitary Authority, for one year.
- JACKSON, Mr. Edward, has been re-appointed Clerk, Surveyor, and Collector to the Graysborough Local Board and Urban Sanitary Authority, Yorkshire, at £70 (£40, £30, and £10) for one year.
- JOHNSON, Mr. Samuel, of the Torquay Bank, has been appointed Treasurer to the Torquay Local Board and Urban Sanitary Authority, *vice* Kitson, deceased.
- JOYCE, Mr. Thomas John, has been re-appointed an Inspector of Nuisances for the Helston Rural Sanitary District, at Ten Guineas for six months ending Michaelmas next.
- LAWSON, Mr. J. E., has been elected a Member of the Buxton Local Board and Urban Sanitary Authority, to fill a casual vacancy for two years.
- LEE, Mr. Robert William, has been appointed Inspector of Nuisances for the Southampton Port Sanitary District, at 30s. a week, *vice* Dacombe, resigned.
- LEWIS, Mr. John, has been re-appointed Inspector of Nuisances for the Mountain Ash Urban Sanitary District, at £40 per annum, for three years.
- LYUS, Mr. H. O., Solicitor, has been re-appointed Clerk to the Diss Local Board and Urban Sanitary Authority, for one year.
- MACMAHON, Mr. Charles, has been re-appointed Inspector of Nuisances, and Surveyor of New Buildings, to the Torquay Local Board and Urban Authority, for the seventh time, for one year, from March 25, at £120 per annum.
- MARSLAND, Mr. Ellis, has been appointed Surveyor under the Metropolitan Building Act for the East Kensington District.
- METCALFE, Mr. J. K., has been elected a Member of the Liversedge Local Board and Urban Sanitary Authority, *vice* Jackson, deceased.
- MULLEN, Mr. R. G. (who had previously been acting *pro tem.*), has been appointed Clerk to the Bromley, Kent, Local Board and Urban Sanitary Authority, at £100 per annum, and to the Bural Board at £50 per annum.
- NAUNTON, Mr. George Thomas, has been re-appointed Surveyor to the Town Council and Urban Sanitary Authority of Southwold, at £10 for one year.
- NEGUS, Mr. Thomas, has been re-appointed Surveyor and Inspector of Nuisances to the Camborne Local Board and Urban Sanitary Authority, at £107 10s. for one year.
- PARR, Mr. Edward, has been appointed Surveyor and Inspector of Nuisances to the Hucknall-Huthwaite Local Board and Urban Sanitary Authority, at £7 10s. per annum, *vice* Hick, resigned.
- PASCOE, Mr. Joseph, has been re-appointed an Inspector of Nuisances for the Helston Rural Sanitary District, at £15 for six months, ending Michaelmas next.
- PATMAN, Mr. William, Branch Manager of the Halifax Joint Stock Bank, has been appointed Treasurer to the Hebden Bridge Local Board and Urban Sanitary Authority, *vice* Harrop, resigned.
- PORTER, Mr. William Henry, has been re-appointed Inspector of Nuisances for the Southwold Urban Sanitary District, at £10 for one year.
- RAWLIN, Mr. George Richard, has been re-appointed Collector to the Swinton Local Board and Urban Sanitary Authority, at 2 per cent. commission for one year.
- REDMAN, Mr. James, has been re-appointed Surveyor and Inspector of Nuisances to the H. worth Local Board and Urban Sanitary Authority, at £110 for one year.
- REES, Mr. Thomas, jun., has been re-appointed Collector to the Usk Local Board and Urban Sanitary Authority, at £10 for one year.
- ROWLANDS, Mr. Henry, has been re-appointed Inspector of Nuisances for the Cardigan Rural Sanitary District, at £40 per annum for three years.
- SALISBURY, Mr. John, has been re-appointed Inspector of Nuisances for the Ashby-de-la-Zouch Urban Sanitary District, at £30 for one year.
- SLADEN, Mr. Samuel, has been appointed Collector to the Gaisley Local Board and Urban Sanitary Authority, Yorkshire, at £3 per annum, *vice* Pullan, resigned.
- STANLEY, Mr. J., Inspector of Nuisances for the Thorne Rural Sanitary District, Yorkshire, has been appointed an Inspector under the Canal Boats Act.
- SPRINGFELLOW, Mr. James, has been appointed Collector to the Hucknall-Huthwaite Local Board and Urban Sanitary Authority, at £7 10s. per annum, *vice* Hick, resigned.
- THOMAS, Mr. Owen, has been appointed Surveyor and Inspector of Nuisances to the Beaumaris Town Council and Urban Sanitary Authority, at £42 per annum, *vice* Mr. Evan Thomas (his father), resigned.
- TURNER, Mr. William, has been re-appointed Collector to the Rawmarsh Local Board and Urban Sanitary Authority, at £104 for one year.
- WARNER, Mr. William Frederick, has been re-appointed Clerk to the Mansfield-Woodhouse Local Board and Urban Sanitary Authority, at £25 for one year.
- WHITE, Mr. Henry, Solicitor, has been appointed Clerk to the Hursley Guardians, Rural Sanitary Authority, &c., *vice* Moss.
- WHITEHEAD, Mr. James, jun., has been re-appointed Inspector of Nuisances for the Rawmarsh Urban Sanitary District, at £60 for one year.
- WHITLEY, Mr. John Rhodes, Solicitor, has been re-appointed Clerk and Collector to the Haworth Local Board and Urban Sanitary Authority, at £110 for one year.

PUBLIC ANALYSTS.

- ALLEN, Mr. Alfred H., has been re-appointed Public Analyst for the Borough of Sheffield, at £100 for one year.
- HUGHES, Mr. Thomas, has been re-appointed Public Analyst for the Borough of Newport, Mon., at £40 per annum for quarterly reports and analyses of Food or Drugs; analyses of water to be paid for separately as private work; 10s. 6d. for each analysis of Food or Drugs for individuals.

MORGAN, Dr. William (previously appointed *pro tem.*), has been appointed Public Analyst for the County of Monmouth, at £10 per annum, and 10s. 6d. for each analysis of Food or Drugs, and 21s. for each analysis of Water, *vice* Thomas.

VACANCIES.

MEDICAL OFFICER OF HEALTH for the Mutford and Lothingland Rural Sanitary District and the Lowestoft Urban Sanitary District, at the rate of £130 per annum, for the Lowestoft Port Sanitary District at the rate of £30 per annum, and Medical Officer to the Lowestoft Urban Sanitary Hospital at the rate of £20 per annum, all for three months, from June 14 to Sept. 29. Applications, 18th inst., to J. E. Cook, Clerk to the Joint Committee, 145 High Street, Lowestoft.

MEDICAL OFFICER OF HEALTH AND INSPECTOR OF NUISANCES for Llandysilio (or Menai-Bridge) Urban Sanitary District: £5 and £12 per annum. Application, 18th inst., to Thomas Hughes, Clerk, Menai Bridge.

PUBLIC ANALYST for the County of Nottingham: £50 per annum, and 10s. for each analysis beyond fifty in each year. Application, 23rd inst., to Mr. Patchitt, Petergate, Nottingham (on behalf of the Finance Committee).

CLERK to the Bethesda Improvement Commissioners and Urban Sanitary Authority: £50 per annum. Application, 18th inst., to John Thomas, Clerk, Market Street, Carnarvon.

CLERK to the Carlisle Guardians and Rural Sanitary Authority.

CLERK, SURVEYOR, AND COLLECTOR to the Blackrod Local Board and Urban Sanitary Authority. Application, stating salary required, to James Eckersley, Esq., Chairman.

ARCHITECT to the Town Council and Urban Sanitary Authority of Norwich: £200 per annum, with offices, coal, stationery, &c. Application, 20th inst., to H. B. Miller, Town Clerk.

SURVEYOR to the Town Council and Urban Sanitary Authority of Blackpool: £300 per annum. Application, 20th inst., to Thomas Loftos, Town Clerk.

SURVEYOR to the Wednesbury Local Board and Urban Sanitary Authority: £200 per annum. Application to Joseph Smith, Clerk.

SURVEYOR AND INSPECTOR OF NUISANCES to the Sheerness Local Board and Urban Sanitary Authority: £70 and £80 per annum. Application, 20th inst., to Vincent H. Stallon, Clerk, Trinity Road, Sheerness.

SURVEYOR, INSPECTOR OF NUISANCES, AND WATERWORKS MANAGER to the Frome Local Board and Urban Sanitary Authority: £180 per annum. Application to George W. Bradbury, Clerk, Bath Street, Frome.

SURVEYOR to the Broadstairs Local Board and Urban Sanitary Authority.

REPORTS OF PUBLIC ANALYSTS, &c.

THE Public Analyst for the Borough of Nottingham reported that he had analysed twenty-two samples of milk, four of which were adulterated.

Mr. H. F. Cheshire, the Public Analyst for Hastings, reported to the quarterly meeting of the Town Council on the 1st inst. that, during the last quarter, he had analysed nine samples, one of which was adulterated.

Mr. J. Carter Bell, the Public Analyst for Cheshire, reported that during the last quarter he had analysed 183 samples and found the following adulterated:—4 milks out of 39, 4 spirits out of 37, 1 butter out of 4, 1 coffee out of 11, and 1 cocoa. Amongst the divisions of the county Runcorn sent up 34 samples, Hyde 23, Altrincham 20, Nantwich 18, Broxtown 17, Northwich 12, Stockport 12, Eddisbury 22, Macclesfield 12, and Wirral 9.

Mr. J. J. Beringer, Public Analyst for Cornwall, reported that during the quarter he received thirteen samples for analysis. Some samples of spirit showed, as usual, great variations in alcoholic strength; one of them, a sample of gin, being diluted more than the law allows. It is a subject for congratulation that the adulteration of butter is so little prevalent in the county that none of the samples sent to him contained foreign fat. Some of them, however, were of poor quality.

The Police Committee of the Justices for Herefordshire reported to the Easter Court of Quarter Session as follows:—'In reply to the advertisement as to the vacant office of County Analyst, inserted in the local papers, only three applications have been received; the applicants, respectively, being resident in London, Cheltenham, and Bristol. From past experience the Committee feel that it is useless to appoint an analyst resident at such a distance, and they have directed a letter to be written to the Local Government Board to this effect.' The Chairman said that, as the Court were aware, the office of County Analyst had been almost altogether a sinecure. Session after session the report was sent in with the word 'nil' written on it. At length it was thought that this was because the analyst resided at such a distance from the county, and the Committee were desirous, if possible, to get some gentleman appointed within the limits of the county, or close on the borders, but unfortunately, no such gentleman could be found. No answers had been received to the advertisements except from gentlemen resident quite as far off as the gentleman who had recently held the office. The Committee therefore thought it

was better to communicate with the Local Government Board with the view of escaping the necessity of appointing an analyst at all. The statute made provision for securing the services of the analyst for the adjoining jurisdictions when one was not appointed for a particular county. There was a County Analyst at Worcester and at Shrewsbury, and, he supposed, also one at Gloucester, and they were all as accessible as the gentleman who had acted as the Herefordshire County Analyst. It therefore seemed to him that the services of the analysts for the adjoining counties might be secured when required, and so avoid a waste of money in paying an analyst of their own. The Local Government Board had power to compel the Court to appoint a County Analyst, but he hoped they would not do so. The Court approved of the chairman's suggestion, and resolved to adopt it, subject to the approval of the Local Government Board. The report was also adopted.

The committee of the Kent Justices on the Foods and Drugs Act stated in their report read at the adjourned General Session at Maidstone, on Tuesday, April 14, that during the past quarter 154 samples of food, &c., had been submitted for analysis, of which 28 were certified as adulterated. The total expenses amounted to £105 6s. 11d. Twenty persons were proceeded against, but only thirteen were convicted. Two cases were dismissed, and five were not proceeded with. The nine cases which stood over from last quarter all resulted in convictions. The twenty-two fines amounted to £25 13s. 6d. The committee could not hide from themselves, or from the Court, firstly, that their endeavours faithfully to carry out the provisions of the Act had not been successful, and, secondly, that that want of success had been largely in consequence of the want of zealous co-operation manifested at the various courts of petty sessions, sometimes one and sometimes another, and which had from time to time been adverted to by the committee, but unsuccessfully in most instances. In the last quarter three cases were brought before the bench at Rochester, one for coffee adulterated to the extent of 43 per cent., one for butter adulterated to the extent of 100 per cent., in each of which cases a fine of only 5s. was imposed, and one of mustard adulterated to the extent of 46 per cent., for which a fine of 2s. 6d. was imposed. They felt that it was perfectly useless to contend against such indirect upholders of fraudulent practices committed for the most part on those who were unable to protect themselves. But notwithstanding the want of which they complain, the committee were willing for another quarter to carry on the working of the Act, trusting that justices of the peace would give them that moral and material support which the public had a right to expect them to give. After some little discussion it was determined, upon the suggestion of Sir J. Farnaby Lennard, Bart., the chairman, to send a circular letter on the subject to every bench of magistrates in the county.

LOCAL INTELLIGENCE.

At the meeting of the Whitchurch (Hants) Guardians and Rural Sanitary Authority on April 30, letters were read from Mr. Wyndham S. Portal, stating that, acting upon the advice of his medical attendants, he should retire from the Chairmanship at the end of the current parochial year, whereupon the following resolution was passed unanimously:—'That this Board learns with regret the nature of the communications they have heard read, involving, as they do, the severance of a connection with the Whitchurch Board of Guardians, extending over a period of forty years, during which time the management of the Whitchurch Union had been unremittingly and carefully supervised by Mr. W. S. Portal as chairman, to the credit and advantage of the Board and the benefit of the inhabitants of the Union generally; and that they venture to express an earnest hope that, by means of relief from pressure of work, their chairman's health may be completely restored.'

The Devonport Town Council and Urban Sanitary Authority have increased the salary of Mr. Venning, the clerk, from £255 (£105 and £150) to £450 per annum, to include everything except Parliamentary costs, and the preparation of the Parliamentary Register, and work connected therewith.

At the annual meeting of the West Hartlepool Improvement Commissioners and Urban Sanitary Authority, on Tuesday, April 21, Mr. Thomas Furness was elected chairman, and, on assuming office, said that since he became a member of the Board twenty years ago, the rateable value of the district had increased from £41,000 to £130,600, and the population from 14,500 to 33,000, which was almost unparalleled.

The New Forest Guardians and Rural Sanitary Authority recently applied for urban powers, rights, &c., as to the making of by-laws respecting new streets and buildings, within the contributory places of Totton, Lyndhurst, Hythe, and Beaulieu; and at the meeting on April 13, a letter from the Local Government Board was read, stating that they were willing to accede to the application as regards Totton, Lyndhurst, and Hythe; but that as to Beaulieu they considered such powers were unnecessary.

Mr. Howel Gwyn has been re-elected Chairman of the Neath Guardians and Rural Sanitary Authority, for the thirty-second time in succession.

Mr. T. F. Twemlow has been re-elected Chairman of the Newcastle-under-Lyme Guardians and Rural Sanitary Authority, for the thirtieth time.

The Town Council and Urban Sanitary Authority of Reigate, in appointing Mr. Benjamin Griggs as Treasurer, *vice* Stenning, upon the recommendation of the Finance and General Purposes Committee in their report, which they adopted unanimously added:—'And this Council cannot refrain from an expression of its regret at losing the services as treasurer of Mr. Stenning, who has performed the duties

of that office with so much diligence and exactness for the past twenty-one years.

A very painful incident occurred on the evening of Wednesday, April 15, at the close of the monthly meeting of the Kenilworth Local Board and Urban Sanitary Authority. A short meeting of the Highways Committee was held afterwards, at which Mr. Luke Heynes (one of the oldest and most respected members) was observed to be somewhat excited, and shortly afterwards left the table for the purpose it was thought of going home. The business was shortly afterwards brought to a close; and the deputy clerk, on passing through the building preliminary to locking up, was shocked to find Mr. Heynes lying at full length on the floor of the lavatory apparently lifeless. He immediately sought assistance, and Dr. Atkinson and Mr. Bourne were immediately in attendance, but only to find life extinct. The deputy coroner was communicated with; but as the deceased gentleman had for some time been attended by Mr. Bourne for disease of the heart, he considered it was unnecessary to hold an inquest.

The Mountain Ash Local Board and Urban Sanitary Authority have increased the salary of Mr. S. O. Harpur, the surveyor, from £200 to £250 per annum, from March 25 last.

Mr. Richard Welford, who for the past twelve years has been chairman of the South Gosforth Local Board, has resigned his seat, in order to have more time to devote to other work. Mr. Welford's resignation was received with much regret by the other members of the board. Mr. S. H. Farren was unanimously elected chairman in his place.

NOTES AND QUERIES.

Having for some time back been in the receipt of Queries appertaining strictly to sanitary work, and which it would be easy to answer, without having to refer our correspondent to competent professional advisers, we have opened a column in which to register such Queries and Replies thereto as can fairly be expected from us; and our subscribers and readers are invited to make such use of this column as will tend to benefit themselves and the community. Both Queries and Replies will, however, be subjected, if unnecessarily long, to a strict curtailment.

151. HOSPITAL PROVISION.

Under Sect. 131 of the Public Health Act, 'a local authority may provide for the use of the inhabitants of their district hospitals or temporary places for the reception of the sick. Two or more authorities may combine in providing a common hospital.' Has an Urban or Port Sanitary Authority power to erect such hospital in the adjoining district of a rural authority without such combination or the consent of the latter? W. M. L.

[The words of the Act do not specify any particular locality for a hospital, and do not confine the local authority which establishes a hospital to its own district. No individual or local authority has a right to establish a hospital in a place where it is a nuisance, and the local authority of the district where such a hospital was established would have a right to object; but, unless they are prepared to show that the hospital will be a nuisance, the rural authority cannot interfere to prevent its establishment.—Ed.]

152. PETTICOAT GOVERNMENT.

In your discursive remarks on page 456 as to the municipal privileges of woman, you do not refer to the question of her eligibility for the position of Town Councillor or Alderman. Is there anything to prevent her election to either of these offices? GREY MARE.

[Yes. The Municipal Corporations Act of 1882 lays down by its 63rd section that 'for all purposes connected with and having reference to the right to vote at municipal elections, words in this Act importing the masculine gender include women.' If such a special provision had not been inserted, it might have been contended that as any person of full age and qualified by rating and residence, may become a burgess, and as the candidate for corporate office must be selected from the burgesses, there is nothing to prevent women upon the burgess roll serving any municipal office. And such a conclusion might have seemed inevitable, did not the Act distinctly declare that women should have only one municipal privilege—viz., the right to vote.—Ed.]

153. DEFINITION OF DWELLING-HOUSE.

Can you refer me to any case in which the term 'dwelling house' has been legally defined? SURVEYOR.

[There has been no such case, as 'Surveyor' might have ascertained for himself if he had turned to page 63 of our present volume. Sir George Jessel, the late Master of the Rolls, once said in an appeal case with reference to the term dwelling-house, 'What that means nobody can say.' And he went on to observe, 'I have tried, and tried in vain, to frame an exhaustive definition which is satisfactory to my own mind.' There is a so-called definition of the word 'house' in Section 4 of the Public Health Act, which is no definition at all, but only an extension of the term so as to include schools and factories. And there is a semi-official definition of dwelling-house in the Government Model By-Laws as to new buildings, where the term is described as 'a building used or constructed or adapted to be used wholly or principally for human habitation'—from which it would appear that the Legal Department of the Local Government Board have rushed in where Sir George Jessel feared to tread. The Model By-law definition would, of course, only apply in those places where by-laws framed upon the Government code have been adopted; but perhaps it may serve the purposes of our correspondent.—Ed.]

154. REGISTRATION OF HOUSE LET IN LODGINGS.

The landlord of a house let in lodgings within the meaning of Section 90 of the Public Health Act (which has been put in force in our district), refuses or neglects to register his house. How is he to be compelled to do so, and, if he is not compelled, what would you advise? CLERK.

[Register the house yourself. There is no power in Section 90 corresponding with that in Section 77 (as to common lodging-houses) to forbid a person to keep a lodging-house or receive a lodger therein, unless the house has been registered. The chief practical purpose of the by-law requiring registration in the Model Code issued by the Local Government Board, is to aid the local authority by rendering it the duty of the landlord to supply information which may facilitate their subsequent supervision of his premises. Though the landlord who neglects this duty may become liable to a penalty, the local authority would probably find that the reports of their own officers after inspection would readily supply the particulars necessary for the accurate keeping and correction of the register.—Ed.]

155. CISTERN SUPPLY OF WATER: REFUSE REMOVAL.

Sir,—Can you inform me, 1st, whether local boards have the power of insisting on a w.c. cistern supply of water in houses supplied by wells. 2nd. What is the law respecting the removal of 'refuse' from private houses. Is the sanitary authority or tenant answerable for its removal off the premises? 'SUN.'

[1st. This question is a little ambiguous. We do not understand whether the inquiry relates to the power of a sanitary authority (a) to compel the provision of a water-closet, or (b) to require that a water-closet already provided shall be furnished with a cistern apparatus for purposes of flushing. In the first case (a), a sanitary authority has no power to require the provision of any particular form of excrement receptacle. By Sect. 35 of the Public Health Act they may require a house to be provided with a sufficient water-closet, earth-closet, or privy: the last two forms being thus specifically recognised as permissible. In the second case (b) a water-closet without a proper and regular supply of water would not only be a misnomer, but would, no doubt, come within the definition of a nuisance in Sect. 91 of the Act. 2nd. See Sects. 42 and 44 of the Public Health Act, the intention of which, read together, is evidently that in all places of any size the sanitary authority shall exercise the powers of Sect. 42 by themselves undertaking or contracting for the removal of house refuse from premises. But where for any reason they do not undertake this duty, they are empowered by Sect. 44 to make by-laws imposing upon occupiers the responsibility of removal, at such intervals as the authority think fit. If the local authority have neither arranged for the removal nor made by-laws under Sect. 44, the only power which they have is action under Sect. 91 *et seq.*, where the accumulation of refuse has become a nuisance.—Ed.]

156. WATERING THE STREETS.

Under what Acts are local authorities bound to water the streets, and water companies to supply the water for the purpose? AQUARIUS.

[Local authorities are not obliged to water streets. Sect. 42 of the Public Health Act provides that the local authority may, and when required by order of the Local Government Board shall, themselves undertake or contract for the proper cleansing of streets, and may also undertake or contract for the proper watering of streets for the whole or any part of their district; so that what is possibly be obligatory in the case of cleansing is only optional in the case of watering. If our correspondent asks us the reason for this extraordinary distinction, we cannot tell him. The conditions upon which water companies supply water for cleansing and watering the streets are laid down in Sect. 37 of the Waterworks Clauses Act 1847. In all the pipes to which any fire-plug shall be fixed the undertakers are bound to provide and to keep constantly laid on a sufficient supply for the above and other public purposes at such rates, in such quantities, and upon such terms and conditions as may be agreed upon between the local authority and the undertakers, or, in case of their disagreement, as settled by two justices.—Ed.]

157. 'A SIMPLE METHOD OF TESTING THE PURITY OF AIR.'

Would you kindly inform me in your next issue where I can procure Professor Wolpert's apparatus figured at page 402, March number of the SANITARY RECORD.

R. BRYDEN HILL, M.D., &c.
Medical Officer of Health, Oldham.

[We have had many inquiries for this apparatus. It can be procured from Messrs. Hill and Hey, Halifax, Yorkshire.—Ed.]

158. LIABILITIES OF WATER UNDERTAKERS.

Can you give information on the following legal point? Suppose a water company or a local board of health supplies a town with water, and charges a rate on every house using the water—continues to supply water they have been told is not pure, and from the nature of its source is liable to dangerous contamination. Is the town liable to be called on to compensate any householder whose family may suffer from typhoid fever if supposed to have been caused by the water supplied? And further, is a sanitary authority justified in continuing to supply water from a source known to be liable to pollution by human excrement, trusting only to filtration to remove the danger? SANITAS.

[See on this subject the leading article on page 507. To continue the supply of water known to be liable to pollution by human excrement would be in the highest degree unjustifiable, and a moral, if not a legal, offence.—Ed.]

ORIGINAL PAPERS.

THE SELECTION OF DOMESTIC WATER SUPPLIES.

By

HERCY F. FRANKLAND, Ph.D., B.Sc., F.C.S., F.I.C.

SCARCELY a year passes by without the question of obtaining a new water supply for the metropolis being raised in some quarter. Novel schemes are from time to time proposed, or old ones, which have already received more than their share of attention, are redrafted, and again presented to the public. When it is remembered that the interests of four million human beings are directly involved in this matter, it is not surprising that it should continue to be discussed with unflagging zeal, and in all probability the end of this discussion is still very far distant, if, indeed, it will ever be reached.

The subject of water supply in general is so wide and many-sided that it is impossible for any one man to be perfectly conversant with all its various aspects, and it is, doubtless, on this account that such great divergence of opinion exists, where, in the interests of the public, it would be desirable that there should be unanimity. It is hardly to be expected that one and the same person can be an authority equally on the financial, engineering, and sanitary problems which present themselves in every question of water supply, and it is probably owing to the tendency which specialists exhibit of making authoritative utterances outside their own particular provinces that much valueless material has become incorporated in a discussion already sufficiently complex in itself.

Of the financial and engineering sides of the question, the public generally can have little or no knowledge, however important both, and especially the first, may be to them; but as to the sanitary part of the subject, it is desirable that every educated person should be well informed, for, although the inhabitants of large cities and towns have but little voice in the choice of their water supply, in rural districts, on the other hand, the important duty of selecting the best available water frequently falls upon the individual householder, whose ignorance may bring upon himself and his family consequences as disastrous as they are avoidable. Unfortunately, the highly conflicting statements with which the literature of water supply abounds, leaves the lay public who are seeking after truth in a state of darkness from which it is difficult to extricate themselves, hence it is hardly possible, without the expenditure of much time and trouble, to read between the lines of evidence, consisting as it generally does of skillfully manipulated facts and theories intended to present some particular point of view in its most laudable form.

In the following pages I have endeavoured to place before the reader, in as concise a form as possible, the present state of our knowledge concerning the sanitary aspect of water supply.

In judging of the fitness of a water for dietetic use, it is necessary that we should consider,

1. The Mineral constituents of the water.
2. The Organic constituents of the water.

1. *The Mineral Ingredients of Potable Water.*—It might have been anticipated that the investigation of the mineral constituents would offer but little difficulty, inasmuch as the precise mineral sub-

stances present in waters can be readily ascertained, and the effect upon the human organisation of these individual substances, in the proportion in which they exist, easily determined. As a matter of fact, however, it is one thing to determine the effect of a certain dose of a particular salt when this is administered on a few occasions, and a very different thing to estimate the effect of the same dose when taken daily for many years in succession, and in different states of health and disease. That this difficulty has, indeed, militated against the acquisition of any precise knowledge concerning the physiological properties of water containing different mineral ingredients is sufficiently apparent from the conflicting opinions of medical men with regard to the respective merits of hard and soft water for dietetic use. Not that medical men do not frequently hold very decided opinions on this subject; for, just as might be anticipated, the absence of any precise knowledge gives scope for the development of strong convictions possessing an imaginary rather than an actual basis.

That the presence of very large quantities of saline matters is capable of imparting marked physiological properties to water is evident from the medicinal use of natural waters strongly impregnated with salts.

All persons must be agreed that a water possessing distinct medicinal properties would be an undesirable water for ordinary and everyday dietetic use. Now there is every shade of gradation between waters of this distinctly medicinal character and waters which are in constant use for dietetic purposes, and it is consequently exceedingly difficult to draw a hard and fast line between waters which are suitable for ordinary, and those which are only fit for medicinal use. It must, however, be admitted by everyone that it is desirable to possess a water containing as little foreign matter as possible, so that the foreign matter introduced into the system may be, as far as possible, under the control of the individual. Thus, although we are unable to attribute any injurious properties to water containing even a very considerable proportion of saline matter, yet in the selection of a source of water supply there can be no doubt that, in the present state of our knowledge, a water containing a small proportion of mineral matter should, other things being equal, be preferred to one containing a large proportion of such matters.

The vast majority of the waters in general use for dietetic purposes in this country contain less than 50 parts of solid matter in 100,000 parts of water (35 grains per gallon), and there is little or no evidence to show that this amount is either desirable or undesirable; but when the proportion approaches to or even exceeds 100 parts in 100,000 (70 grains per gallon) then there would appear to be sufficient reason to inquire into the desirability and possibility of obtaining another source. Much must of course depend upon the actual constituents of this mineral matter, and where it principally consists of common salt, little or no cause of anxiety or suspicion need exist. When, on the other hand, the mineral matter is largely composed of salts of lime and magnesia, the possibility of these becoming converted into insoluble forms within the system must be borne in mind. It was given in evidence, before the Royal Commission on Water Supply, by the late Prof. Parkes, that a very marked difference exists between the so-called permanent and tempo-

rary hardness of water in respect to their influence on health. It was the opinion of Dr. Parkes that the bicarbonates of lime and magnesia, constituting the 'temporary hardness' of water, were in general innocuous, or almost so, whilst their chlorides and sulphates, constituting the 'permanent hardness,' could not be regarded in so innocent a light. Dr. Parkes did not state the exact grounds upon which his opinion was based, and I am not aware that any later evidence has further established this alleged difference.

In the absence, therefore, of any convincing evidence bearing upon the relative merits of hard and soft water for dietetic use, I think we shall do well to recognise our own ignorance, and avoid being carried away by any theories which are unsubstantiated by facts. For the present, then, although we may view waters of excessive hardness with suspicion, we must regard all waters, which are of only moderate hardness, as, *ceteris paribus*, equally fitted for ordinary dietetic use.

We must now turn our attention to

II. *The Organic Ingredients of Potable Water.*—This portion of our subject requires to be considered from two distinct points of view—1. *Chemical*; 2. *Biological*.

We shall presently see that it is of great importance that these two aspects of the subject be preserved quite distinct, and not confounded together.

In considering the organic ingredients of water from a chemical point of view, we are concerned in ascertaining not only the amount of the organic matter present, but also in discovering its origin, whether vegetable or animal.

Although we are unable by chemical analysis to determine the absolute quantity of organic matter present in water, yet we can compare the proportions of organic matter in different waters from the amount of organic carbon and nitrogen which they contain. Since the proportion of organic carbon and nitrogen in water can be determined with very considerable accuracy, the question arises whether it is possible from a knowledge of these ingredients to decide upon the fitness of the water for dietetic use. Now here we are at once met with the same difficulty which confronted us in the case of the mineral ingredients. And similarly, *no precise limit* can be fixed to the proportion of organic matter which may be present in water without interfering with its wholesomeness, just as no precise limit to the hardness and other saline matters could be decided upon. In the case of the organic matter, however, the practical limits of variation are very much more restricted, and not nearly so wide, as in the case of the saline matters, for the proportion of organic matter cannot rise above a very small absolute amount without impairing the palatability of the water.

Now it is often very doubtful whether the unpalatability of water renders it unwholesome, but it is always accepted on all sides that an unpalatable water is unfit for dietetic use. An unpalatable water will, in fact, be almost invariably condemned without the trouble of a chemical analysis being incurred at all, and no expert report, however confident and authoritative (and such reports are sometimes very confident and very authoritative) could shake the vulgar prejudice against an unpalatable water. But although the factor of unpalatability places an upper limit to the amount of organic matter which the popular taste will tolerate in water, this

by no means precludes the possibility of waters, which contain far too little organic matter to render them actually unpalatable, being yet of the most dangerous character. The proportion of organic matter in water is, in fact, when taken alone, of but little value in deciding upon the fitness of the water for dietetic use. It is essential that we should also take into consideration the origin of the organic matter present.

Organic matter that has been derived from vegetable substances can, when present in moderate quantity only, cause little or no anxiety, for it is possessed of no noxious properties that we are aware of. We may object to the slightly brown colour which such vegetable organic matter not unfrequently imparts to water, we may object also to the slightly bitter taste which it sometimes causes, but fear of its unwholesomeness we have no reason to entertain. The case is, however, entirely different with regard to organic matter which is of animal origin. The animal matters gaining access to water are almost exclusively the excrements of man and the lower animals: these, and especially the former, we know positively are capable of producing the most serious results in communicating disease, and, therefore, the presence of any organic matter of this kind in drinking water is justly viewed with alarm. It is thus evident that in the case of organic matter the question of *quantity* is to a great extent subsidiary to that of *quality*, and it will be seen how worthless must any comparisons between waters be which is based upon the relative proportions of their organic matter irrespectively of its origin. Thus how irrational it would be to compare the waters of the Thames, receiving as they do the drainage from vast tracts of manured land, and the sewage, either raw or treated, of numerous towns and villages, with the waters of Loch Katrine, which are derived from an upland area, unturned by the plough and almost destitute of population. Yet, notwithstanding this great contrast in their origin, if the merits of these two waters were judged by the amount of organic matter which they contain, the balance would not unfrequently be in favour of the Thames water.

Fortunately chemical analysis furnishes us with other data for judging water than the mere aggregate amount of the organic matter it contains, for in proportion of organic carbon to organic nitrogen we possess some guide at least as to the origin of the organic matter in question. Thus, since animal organic matter is generally more highly nitrogenous than vegetable matter, therefore highly nitrogenous organic matter in water should be viewed with more suspicion than that which is less rich in nitrogen. It is necessary, however, to employ this criterion with great caution, as it is obvious that a comparatively small amount of animal pollution might be wholly masked and obscured by a relatively large proportion of vegetable matter. This source of error is, however, to a certain extent diminished by an important difference which animal and vegetable substances exhibit when they are respectively subjected to decomposition by natural agencies. The highly nitrogenous animal substances in undergoing decay yield a very notable proportion of ammonia in the first instance, which, under suitable conditions, is acted upon by certain definite fermenting or living organisms with production of nitrates and nitrites. The vegetable substances, on the other hand, being relatively poor in nitrogen, yield

composition a very much smaller proportion of nitrogenous mineral compounds, and therefore nitrogenous mineral compounds, although absolutely distinctive of the decomposition of organic matters, are yet able in most cases to give important testimony as to the contamination of water by animal substances. Indeed, although many waters of which it is extremely difficult to find chemical evidence alone to form an opinion as to the source of their organic matter, there is a very large number in which chemical analysis distinctly points either to a vegetable or to an animal source. In all cases, however, it is desirable that the purely chemical evidence should be interpreted by the light of a complete knowledge and understanding of the water's source.

We have already seen that we are unable to prescribe any fixed limit to the amount of vegetable matter which may be present in water without impairing its general wholesomeness, and we are unable to fix any exact limit to the amount of animal matter in water which may be consumed with impunity. For although we know that an excessive quantity of either vegetable or animal matters in drinking water is capable of producing diarrhoea, the small proportions in which such matters are generally present in potable water themselves usually possessed of no toxic qualities. Now although these small quantities of vegetable or animal organic matters are in themselves generally equally innocuous, we rightly judge the presence of even the merest trace of organic matter in drinking water with alarm, whereas a much larger proportion of vegetable matter is regarded with indifference. In order to understand this striking contrast in our views with regard to two different kinds of organic matter, we must turn to the consideration of the subject from a different point of view.

In ordinary circumstances a very small portion of organic matter in water, whether vegetable or animal in origin, is living or organised. Organised matter consists of one or more of numerous minute forms, or micro-organisms, which are now frequently termed, which make their appearance and flourish in decomposing vegetable and animal substances. As far as our present knowledge extends, the micro-organisms which multiply on vegetable matters are without danger to health, as are also those generally present in decomposing animal matters; but, under exceptional circumstances there is every reason to believe that some of these animal matters, and notably sewage, accompanied by micro-organisms which are capable of inducing specific diseases. Thus the presence of patients suffering from certain zymotic diseases are known to possess the power of communicating the same diseases to persons drinking water which has been contaminated with such matters.

Thus, although the excreta of healthy persons gain access to drinking water without producing any mischief; water which has been polluted, even to the smallest extent, may nevertheless become dangerous to health, and is rightly regarded with suspicion and alarm.

Evident, therefore, how utterly fallacious is the notion of water being rendered safe by actual results. We can easily deceive ourselves a completely isolated community holding any intercourse with the outside world in which zymotic disease was unknown. In a community the contamination of water

with either vegetable or animal matters would be regarded with equal indifference; and it is probable that even the sentimental prejudice against drinking sewage-polluted water could there not have become developed by evolution. Now, communities of this kind, or of a kind closely approximating to this, are by no means uncommon: thus, many of the small villages throughout the country enjoy, for long periods of time, excellent health, in spite of the most unsanitary conditions of water supply. Owing to the comparative isolation of such villages, zymotic diseases are but rarely introduced; and, therefore, the water from the foul wells which generally abound may be consumed for years with impunity and without revulsion.

Since, then, the wholesomeness or unwholesomeness of water depends upon the absence or presence of certain specific organisms, the question naturally arises whether there is any biological test which is capable of assisting us in the choice of a suitable source of water supply. At the present moment I think it may be emphatically stated that no biological test which has been yet devised can supply us with anything like the information which is obtainable by chemical analysis. We have exceedingly beautiful and ingenious tests for ascertaining the number of individual organisms present in a given water; we have also within the last few years obtained the requisite means of identifying various specific forms. These tests are, however, of but little value in determining the quality of water for dietetic use. A water may contain a multitude of organisms, and yet be perfectly wholesome, whilst, on the other hand, it may be almost wholly destitute of organic life, and yet those few organisms which it does contain may be of the most deadly character. At first sight some valuable assistance might be expected from the identification of noxious or pathogenic organisms, the study of which has been so actively pursued during recent years; but it must be remembered that such organisms will only be present under exceptional circumstances even in waters of the worst quality; and that, therefore, their absence on any given occasion can afford no permanent security whatever. Now, if there were any organisms absolutely characteristic of sewage in general, then a biological test applied with a view to discovering such organisms in water would be of the highest value. At present, however, no organisms absolutely distinctive of sewage are known to exist.

Under these circumstances there are two salient questions which must be satisfactorily answered before a source of water supply can be deemed safe. These questions are:—

1. Is the source such that any sewage or other refuse animal matters can gain access to the water?
2. If such matters have gained access to the water, has the latter passed through any process, either natural or artificial, which can ensure the removal or destruction of any pathogenic organisms which may have been present in the sewage matters with which the water has been polluted?

The first of these two questions must be answered by a personal inspection of the source itself, and the water must also be free from suspicion on analysis. Few waters can, of course, be found possessing such an unimpeachable pedigree that it can be positively stated of them that at no time have they received any accession of sewage matters; but there do exist very large volumes of water, like the waters of many

lakes in mountainous districts, which can have only received an altogether inappreciable amount of such sewage contamination, and these waters we are compelled to recognise as amongst the safest which nature affords.

The second question, which it is almost always necessary to put to a water, is, unfortunately, very difficult and often impossible to answer. The truth is that we are so little acquainted with the effect of various processes upon micro-organisms, that it is impossible to say whether, and to what extent, the risk of drinking sewage-polluted water is diminished by the processes of purification which it may have undergone since its pollution. Again, the difficulty of inspecting these processes, which usually take place beneath the earth's surface, is sufficiently apparent.

Under these circumstances it appears to be only reasonable that we should regard, as the most reassuring, those processes which are capable of reducing to a minimum the organic matter present in water. Now, of all the processes to which water is subjected in nature, we find that prolonged filtration through porous strata, especially such varieties as chalk, oolite, and sandstone, is the most efficient in reducing the quantity of organic matter. The waters derived from such sources stand, in fact, unequalled amongst natural waters for their great purity as regards organic matter, and it is on this account that they are daily becoming more appreciated for dietetic use. If this prolonged filtration is capable of almost wholly removing all organic matter both in suspension and solution, it is only reasonable to suppose, with our present knowledge, that it will be highly efficient also in removing those minute micro-organisms which may have been present in the original water. Water which has undergone this exhaustive filtration is obtained from many natural springs, but more generally by sinking deep wells into the water-bearing strata. During the past year two borings of this kind in the vicinity of London have attracted no little attention. The first of these, at Richmond, had been progressing for a number of years past, but, owing to the absence of any sufficient quantity of water being met with, the boring was continued to a depth of upwards of 1,400 feet, until finally the new red sandstone formation was in all probability reached. Here water was found, indeed, containing only a small proportion of organic matter, but remarkably rich in mineral salts, and altogether deficient in quantity. As the boring thus appeared to yield almost as good prospects of reaching coal as an adequate supply of water, it was finally abandoned as a failure only a few months ago.

Another, but far more successful boring, has been carried out by the Southwark & Vauxhall Company, at Streatham. This well yields an abundance of water containing the merest trace of organic matter, as shown by an analysis made in my laboratory, and forms an excellent illustration of the remarkable purification which prolonged filtration through porous strata is capable of effecting.

The waters which find their way into shallow wells undergo a process of purification by filtration, which is essentially of the same kind as that we have just considered, only less in degree, and consequently we find that, as a general rule, the amount of organic matter in shallow-well water is very much in excess of that present in deep-well or spring water. It is only reasonable to infer, therefore, that the process

of filtration to which shallow-well water is subjected must be very much less likely to remove micro-organisms, should they be present, than the far more perfect filtration which the deep-well water has undergone. And from the disastrous consequences which have so often resulted from the use of polluted shallow-well water, there can be no doubt that frequently the filtration is altogether inadequate to remove pathogenic micro-organisms should they be present.

Of essentially the same nature as the percolation of water through porous strata is the process of artificial filtration through sand, which is resorted to by water companies drawing their supplies from turbid sources. With our present knowledge it is very difficult to say what the precise value of this process from a biological point of view may be; that it is very much better than nothing there can be no doubt, but, on the other hand, it is equally certain that it by no means guarantees the complete removal of micro-organisms. Under these circumstances we must regard the process of filtration through sand as valuable in diminishing the risk which attends the use of polluted water, but by no means as guaranteeing the safety of such water.

In speaking of the filtration of water, I ought to mention that filtration through sand may be very advantageously supplemented by filtration through spongy iron. Filtration through a comparatively small column of this material exercises a greater purifying effect, as regards living organic matter, than much more exhaustive filtration through sand and similar materials. I find, however, that fresh and highly ferruginous sand is also, like spongy iron, capable of entirely removing micro-organisms, its power being doubtless due to the iron which it contains, but, as the ferruginous matter is gradually removed or rendered inert, it rapidly loses this power. Indeed, so powerful is the effect of iron upon the lower forms of life, that mere agitation of the water with this material for a few minutes, even without filtration, is capable of removing a very large proportion of the micro-organisms that may be present in the water. I have not, however, been able to effect the *complete extinction* of organic life even when the agitation of the water with the spongy iron was continued for fifteen consecutive minutes.

With the exception of exhaustive filtration through porous strata, there is no natural process of purification which offers any sort of guarantee that micro-organisms once introduced into water will be either removed or destroyed. The prolonged subsidence which water undergoes in lakes and large reservoirs may, doubtless, lead to the precipitation of a large proportion of the micro-organisms present, and this reduction will doubtless be the greater the more turbid the water was before subsidence, the settling suspended particles entangling and carrying down with them the still more minute living matter.

A similar improvement, as regards organic life, must take place, although to a much less extent, in the deeper pools of rivers, but the matters so deposited will be swept out by floods and carried down the stream; so that the risk, which always attends the abstraction of water for domestic purposes from sewage-polluted streams, must be greatly enhanced during times of flood. Bearing this in mind, it is almost unnecessary to point out how important it is that water companies drawing their supplies from such sources should exercise the greatest vigilance.

their intakes as much as possible during times of flood. In order to be able to do this, necessary, of course, that they should be provided with adequate storage capacity. Any increase in storage power of a water company drawing from a sewage-polluted river must, therefore, be regarded as an improvement of no mean importance.

I must refrain from here calling attention to the improvements which have recently been carried out by some of the more advanced engineers attached to water companies deriving their supplies from sources which are not above suspicion, in providing adequate storage reservoirs and filtering apparatus, and thus reducing, as far as lies within their power, the risk which attends the supply of water of this character. As still more hopeful must be the endeavours, of which the boring by the Water Company at Streatham, and of that by the London Company at Chingford are instances, are available for the inhabitants of this city of that most perfectly filtered water which is in the great natural reservoir of the chalk.

It is thus evident that in all questions relating to the choice of a source of water supply the principal thing to be borne in mind is, what is the condition of the water as regards the possibility of its containing micro-organisms of a pathogenic nature? As we have seen, comparatively few waters can be safely placed above the suspicion of ever having contained such organisms, and in general we must therefore, to consider what available source offers the least risk of still containing such living organisms. In deciding upon this point we must remember that the purification of water so as to render it fit for dietetic use is really the same problem as the sterilisation of an infusion of meat or of a solution of gelatine, and the value of each process of purification, whether natural or artificial, must be judged by the light of such established facts as are upon its sterilising power, and that process which affords the most reasonable prospect of effecting such sterilisation must be regarded as the most perfect and desirable.

In the selection of the best available source of water supply we should then be guided by the following principles:—

1. That the water contain only a moderate proportion of mineral ingredients, although very considerable latitude may be permitted in this respect.

2. That waters containing a large proportion of organic matter should, irrespectively of the origin of the organic matter, be deemed unfit.

3. That waters containing only a moderate or even small amount of organic matter be not deemed fit, unless it can be distinctly shown, both by analysis and by inspection, that they are either free from suspicion of any sewage contamination whatever, or that they have undergone some process which may reasonably be considered to offer a guarantee that the water is free from all such organic matters, which may at any time be introduced by company sewage, shall have suffered removal.

In conclusion, we have yet to consider a difficulty of very frequent occurrence, and which is

that, although there exist an unlimited source of water supply, but that it can be rendered available at very great cost to the community, whilst another and inferior source be

either already in use or obtainable for a much smaller sum; then the question must arise whether the advantages attaching to the purer water will be commensurate with the additional cost which its supply entails. Now, I would urge that in the discussion of cases of this kind we should fully and impartially consider the relative merits of the two schemes, so that the choice between them may be made in the full light of the facts, and that no countenance should be given to the practice, which is, alas, too common, of attempting to prop up inferior sources of water supply by means of strained and partisan evidence, professing, indeed, to rest upon an impartial and scientific foundation.

THE LAW AS TO METROPOLITAN SCAVENGING.

ONE of the complaints made by the Royal Commission on the Housing of the Poor in their recent report was that the Metropolitan sanitary law is difficult of comprehension, being distributed over so many Acts of Parliament; and they recommended that it should be consolidated. In no point is this consolidation more desirable than in the enactments relating to scavenging, to which of late much attention has been directed. It is not generally known that there is still an old Act of George III. in existence which has never been formally repealed, but which under Section 73 of the Metropolitan Management Amendment Act of 1862 is, 'so far as the same is in force, and is not inconsistent with the provisions' of more recent Acts, to extend and apply to the whole metropolis as defined by the Act of 1855.

Duties of Scavengers under Act of 1817.—Under Section 59 of this Act (57 George III. c. 29) commissioners (for which vestries and district boards are now substituted) were to agree with persons to be 'the scavengers, rakers, or cleansers of the streets and public places.' Such persons, 'on a certain day in every week,' and oftener when required by the commissioners or any officer appointed by them, were to bring into the streets 'convenient carriages' and 'at or before their approach, by bell, horn, clapper, or otherwise by a loud noise or cry,' were to give notice to the inhabitants. Such scavengers, rakers, or cleansers were to carry away from the respective premises 'the soil, ashes, cinders, rubbish, dirt, and filth,' at their own cost and charges, under penalty of forty shillings for every neglect. Any person who refused to permit the filth to be taken away by the scavengers was liable to a penalty of five pounds. The dust could only be removed by the scavengers duly appointed (Section 60), and the right and benefit of the filth was to belong exclusively to such persons. By Section 61 it was enacted that in case the scavengers neglected for seven days to remove the refuse, then, after twenty-four hours' notice given to the scavenger, it was lawful for the householders who had given notice, 'to give away or to sell their dust, dirt, filth, cinders, or ashes to any person whomsoever,' without subjecting such persons to any penalty.

It is important to note, before we go further, that later Acts, though imposing the duty of scavenging upon the vestries instead of upon Commissioners of Paving, have not in any degree limited the rights of householders under this old local Act of George III.,

save in so far as expressly varied. But of the existence even of the Act of 1817 few people seem to be conscious. Indeed, as a matter of fact, several of those who have referred to the law in the recent correspondence in the *Times*, have talked confidently of the protection afforded by the Public Health Act of 1875, oblivious of the fact that that Act does not apply to London at all, and that the scavenging of the metropolis is regulated by the Metropolis Management Act of 1855, supplemented by the old local Act of 1817 above referred to and by one section of an Act of 1862.

Appointment of Scavengers.—Section 125 of the Metropolis Management Act of 1855 (18 & 19 Vict. c. 120) provides that—

It shall be lawful for every vestry and district board, and they are hereby required to appoint and employ a sufficient number of persons, or to contract with any company or persons, for the sweeping and cleansing of the several streets within their parish or district, and for collecting and removing all dirt, ashes, rubbish, ice, snow, and filth, and for the cleansing out and emptying of privies and cesspools, sewers, and drains, in or under houses and places within their parish or district; and such company or persons are hereinafter referred to as scavengers.

It is left optional therefore with the vestry whether they will appoint a staff of their own, under their own control, or contract with outside persons for the removal of the dust. The former is infinitely the better plan, but, involving a little more trouble to the authority itself, is by no means so general as it ought to be. Bind a scavenger by contract as you will, he will find means, if thereto inclined, to give an infinite amount of trouble to the vestry which appoints him, and of vexation to the householders who are dependent upon his ministrations.

Duties of Scavengers.—Householders are not, it is true, left absolutely without redress for the malfeasance of scavengers, for Section 125 of the Act of 1855 goes on to provide that—

Such scavengers or their servants shall, on such days and at such hours and in such manner as the vestry or district board shall from time to time appoint, sufficiently execute and perform all such works and duties as they respectively are employed or contract to execute or perform; and if any such company or person fail in any respect properly to execute and perform such works and duties, such company or person shall for every such offence forfeit a sum not exceeding five pounds.

It is to be noted in connection with this clause that default of the contractor or of the persons appointed by the vestry to perform the duty of scavenging is punishable by a fine of 5*l.* [it was 40*s.* under the Act of 1817]; but the Act does not say who is to put the law into motion, nor does it apparently provide for the default of the vestry itself. If the sanitary authority undertakes the duty of scavenging by its own officers, it is to be assumed that an aggrieved householder must seek his revenge by getting the vestry's hired servant mulcted in 5*l.* There is a case, somewhat obscurely reported, which would appear to show that the vestry has been held to be the responsible agent in the event supposed (*see* *Guardians of Holborn Union v. The Vestry of St. Leonard, Shoreditch* (35 L. T. (N.S.) 400; 40 J. P. 740; 25 W. R. 40), and clearly this is the only reasonable interpretation of their position.

It has been erroneously assumed that Section 21 of the Sanitary Law Amendment Act, 1874 (37 & 38 Vict. c. 89) applies to the Metropolis. This section provides that—

If any sanitary authority . . . fail without reasonable excuse after notice in writing from the occupier of any house . . . requiring such authority to remove any house refuse . . . to cause the same to be removed within seven days, the sanitary authority shall, on summary conviction, be liable to pay to the occupier of such house a penalty not exceeding five shillings for every day during which such default continues after the expiration of the said period.

This would quite meet the case; but unfortunately Section 21 (unlike others in the Act of 1874) does not appear to be available for the protection of Londoners. For wherever in this Act it is intended to include the Metropolis, its local authorities are always set out as 'nuisance authorities,' the term 'sanitary authority' meaning to the framers of the Act only the urban and rural authorities created by the Public Health Act of 1872. The section we have quoted was an amendment of the Local Government Act of 1858, which only concerned extra-metropolitan local boards; and, moreover, in the Consolidation Public Health Bill for the Metropolis, which Mr. Sclater-Booth introduced in 1877, no mention is made of this section in the Act of 1874. Ratepayers must therefore be content with such powers of heckling the vestries and district boards as Section 125 of the Metropolis Management Act of 1855 confers upon them.

Monopoly of Dust Removal.—The householder has very little option as to the disposal of his refuse, and is, in fact, entirely dependent upon the goodwill of the sanitary authority for its removal. For not only is 'all dirt, dust, nightsoil, ashes, and rubbish' collected by the scavenger the property of the vestry, who have full power to sell and dispose of it as they shall think proper (Section 127 of the Act of 1855), but it is absolutely a punishable offence for the householder to sell or otherwise dispose of his refuse. Section 89 of the Metropolis Management Amendment Act of 1862 (25 & 26 Vict. c. 102) lays down that—

If any person or persons other than the person or persons employed by or contracting with the vestry or district board of any parish or district, or those employed by or under such person or persons, shall receive, carry away, or collect any dirt, dust, cinders, rubbish, ashes, or breeze from any houses, or premises, or from any street or highway in any parish or district, it shall and may be lawful for any justice of the peace, upon complaint to him made, to grant a summons, or, if such justice shall think fit, a warrant to bring before him such offender or offenders; and any person convicted of any such offence shall forfeit to the said vestry or district board a sum not exceeding five pounds, to be recovered by a summary proceeding.

When, therefore, the dust is not removed, the sanitary authority are themselves responsible for the existence of a nuisance injurious to health, and are guilty of the very offence the suppression of which is one of their most important functions. As has already been indicated, the protection against the neglect of the sanitary authority which is afforded to extra-metropolitan householders by Section 43 of the Public Health Act of 1875 is wanting in London; and apparently all that the householder could do if the authority neglected to remove his dust would be (1) to try the effect of

making the authority responsible for the neglect of their servants to perform the duties laid down in Section 125 of the Act of 1855, or (2) to exercise the power given by Section 61 of the Act of 1817 of getting the dust removed by some one other than the duly authorised scavenger (though this would be troublesome and expensive).

Dustbins as a Nuisance.—If a 'dustbin' is in so offensive a state as to be a nuisance within the meaning of Section 7 of the Nuisances Removal Act of 1855, notice may be given to the sanitary authority by their officers or by any person 'aggrieved thereby.' Certainly the unhappy householder is 'aggrieved thereby'; but he could hardly set the law in motion against himself; and apparently redress under the law relating to nuisances could only be obtained in those cases where a person thinks that a nuisance or dangerous accumulation of rubbish exists, *not on his own premises*. There are two courses open in such an event. The complainant may either approach the local authority of the district, and leave them to investigate the matter and to take the necessary steps to have the nuisance removed (Section 11 *et seq.* Nuisances Removal Act, 1855), or he may himself complain to a justice of the existence of the nuisance, and obtain a summons for its removal (Section 13 of the Nuisances Removal Act, 1860). On the hearing of such a summons, obtained at the instance either of an individual or of a local authority, the magistrates, if satisfied that a nuisance exists, have power to order its abatement, and to order anything to be done which may be necessary to prevent its recurrence (Section 13 of Act of 1855). The ultimate safeguard for keeping a district free from pestilential collections of rubbish is, therefore, the power which either the local authority or an aggrieved individual has of invoking the authority of the law to prevent the continuance of a nuisance; but this, of course, could only be done when a dustbin was so offensive as to be a legal 'nuisance.'

Penalty for Obstructing Scavengers.—Section 126 of the Act of 1855 provides that—

Any occupier of any house or land or other person who refuses or does not permit any soil, dirt, ashes, or filth to be taken away by the scavengers appointed by or contracting with any vestry or board, or who obstructs the said scavengers in the performance of their duty, shall for every such offence forfeit and pay a sum not exceeding five pounds.

Very good; but how seldom do the local authority or the scavengers exercise their plain duty to remove the dust from each house at regular intervals, whether the dustbin be overflowing or not, and whether the occupier be willing or no! That a cart should be merely sent through a street, leaving it to chance whether the dustman's cry be heard, to effect the removal of the dust, is to invite people to retain this material in their dustbins.

Removal of Trade Refuse.—Section 128 of the Act of 1855 enacts that—

In case any scavenger be required by the owner or occupier of any house or land to remove any refuse of any trade, manufacture, or business, or of any building materials, such owner or occupier shall pay to the scavenger a reasonable sum for such removal.

In case of dispute as to the 'reasonable sum' to be paid, or as to what is to be considered as trade refuse, the matter is to be referred to the arbitra-

ment of two justices, whose decision is to be final and conclusive. There is no similar provision to this last in the Public Health Act, and we only find in the regular text-books reference made to one decision under this section of the 1855 Act, which helps to define the term 'trade refuse.' In that case, *Gay v. Cadby* (36 L. T. (N.S.) 410; 46 L. J. M. C. 260), it was held that the ashes of coal used for a manufacturer's engine were not 'refuse of any trade, manufacture, or business,' for the removal of which the scavenger was entitled to make a charge. No doubt many things are put into the dustbin which have no right to be there; but it will usually be found that the dustman is extremely alive to the presence of these, and has a very generous interpretation of Section 128 of the Act of 1855 to bolster him up in his refusal, without a further bribe beyond his customary *douceur*, to cart them off the premises. It might possibly be desirable that, as Mr. Eassie suggested in his letter to the *Times* of the 25th ultimo, 'the local authorities should positively define in detail what does and what does not constitute "household refuse" within their boundaries'; but to leave it to the authorities—that is, to the grimy individual who represents them for the nonce when he comes to fetch away your dust—an option to refuse the removal of anything that he chooses to class as outside the schedule, seems to leave the householder at the mercy of the scavenger in presence of a nuisance which it is important for him to have removed, and which cannot be conveniently got rid of in any other way than by the orthodox dust cart. (See p. 562.)

HEALTH STATISTICS OF NEW YORK.—The weekly bulletin of the Health Department of the City of New York, compiled by Dr. John T. Nagle, corresponds in some sort to the Registrar-General's weekly return in this country. It gives a mass of valuable statistical information as to the number of deaths occurring not only in New York, but in other American and in foreign cities, classified by ages, diseases, wards, and the like. Recent returns show the death-rate of New York to be unduly high, being not seldom over 30 in the thousand. Diphtheria seems to have been of late unusually and fatally prevalent in the city.

NEW AGENCIES FOR THE PROPAGATION OF SMALL-POX.—The last new thing in the way of agencies for the propagation of small-pox is reported by Dr. Dudfield in a recent report on Kensington. Five cases of small-pox occurred among the members of an amateur 'nigger troupe.' Dr. Dudfield thinks it a little doubtful whether the infection was conveyed by a member of the troupe previously and slightly affected, or by the 'properties,' purchased, about a fortnight previous to the first of the four cases, at Petticoat Lane! He also adverts in the same report to the unusual occurrence of three 'second cases' in three houses, too long after the first cases, and at a too considerable interval after disinfection of the premises, to enable him to account satisfactorily for their origin. As a matter of fact, it would appear that the people so attacked had received letters from the 'first cases' in hospital, and it becomes an interesting question whether this may not explain the infection. Patients appear to be rather encouraged to write to their friends, but the practice is objectionable, and one that should be as much restricted as possible, for beyond any question susceptible people may take small-pox infection conveyed in a sheet of paper. 'Possibly,' says Dr. Dudfield, 'a post-card would be less dangerous as regards the recipient of news, but, for obvious reasons, not less objectionable, unless, indeed, the post-card should be disinfected, an impracticable process in the case of enclosed letters.'

THE HOUSING OF THE POOR IN SCOTLAND.

APPARENTLY seduced by the favourable reception accorded to their first report, the Royal Commission on the Housing of the Poor hurried out a week after its publication a second report, dealing with the state of affairs in Scotland. This was an error of judgment, properly punished by the report falling upon almost deaf ears: for time had not been given for the proper mastication of the first course before the public was called upon to swallow the second. We are not saying that the comparative oblivion of the Scotch report is unmerited. On the contrary, we think it distinctly inferior in tone, in interest, and in style to the English report. It appears to have been hurriedly compiled, and its recommendations carelessly thought out; though it is just perhaps to say that the question of the homes of the poor is shown by it to be of far less serious import in Scotch than in English towns. Following our customary plan, we analyse the report according to the several sub-heads of the subject of which it treats, making such running comments thereon as arise naturally out of the recommendations. But obviously the question is not one merely of the amendment of this section, or the strengthening of that Act, or better administration or consolidation of areas. The housing of the poor affects more or less some of the great social problems of the day—such as the system of land tenure, local taxation, self-government, the powers of municipalities, the limits of State help to individuals, and many others. Such of these questions as are germane to the objects which the SANITARY RECORD sets itself to accomplish may perhaps be discussed in these columns at a later date, by the light of the evidence laid before this and other Royal Commissions. At present we must confine ourselves to the actual state of affairs in Scotland, and the recommendations of the Commission.

The Scotch Law as to Artisans' Dwellings.—It is nearly always necessary to speak with bated breath of Scotch law, as a thing uncanny and mysterious. But in respect to artisans' dwellings, Scotland appears to have done as much—or as little—in the way of legislation as England, except that there is no provision for general building by-laws. Scotland stopped short in its general public health legislation in 1867; but it has powers for the repression of nuisances and of overcrowding, and is even able to make regulations for houses let in lodgings, though this 'is almost unknown, even to officials whose lives are passed in administering the sanitary law.' Mr. Torrens's Acts extend over Scotland, but they 'have been practically a dead letter.' Similar Acts to Sir Richard Cross's Acts were passed in 1875 and 1880, but such authorities as have gone in for clearing unwholesome sites seem to have preferred private Acts of their own. Indeed, the general state of Scotch sanitary law would appear to be an effete general statute, which in the country is more or less totally ignored, and in the towns is superseded by sanitary codes of the local authority's own making. Naturally, the Commissioners recommend a 'consolidation' of the law, and even throw their *agis* over the cumbersome Burgh Police and Health (Scotland) Bill, now before Parliament, on the ground that 'it contains many provisions likely to improve the condition of the dwellings of the working classes.' The Commissioners advise

the introduction of a uniform system of administration in sanitary matters, noting that 'the existence of important local Acts has perhaps caused a neglect of general public Acts.' They also think that building by-laws should be made general throughout the country where there is no private Act.

The Single-Room System.—The general feeling expressed in the evidence as to the large towns of Scotland is that the condition of the housing of the working classes, though in many cases deplorable, is not of the extremely miserable character described as existing in London; that efforts have been made for its amelioration, not without marked effect; and that the causes of existing misery are to be ascribed as much to the habits of the people as to outside influences. The single-room system appears to be an institution co-existent with urban life among the working classes in Scotland.

The size and height of ancient Scotch houses, in the old town of Edinburgh for instance, would be sufficient to show that they were always intended for the habitation of many families, even if this were not a well-known historical fact. The system is so firmly established in Scotland that the Scotch law provides for the difficulties which may arise out of the joint-ownership of a house in portions. It is not in Edinburgh alone that are found these large tenement-houses, nor are they always ancient buildings. At Paisley they are said to be on the increase, and it seems in Scotch towns to be as usual to run up an edifice of great height, containing a number of separate dwellings, as it is in England to build a row of two-storeyed cottages. At Glasgow it is acknowledged that an extraordinarily high proportion of its population live in single rooms, but it is said that the single rooms are much larger than elsewhere. The single-room system is an incident of the tenement-system. In Edinburgh there are said to be 14,000 single-room tenements; in Glasgow 25 per cent. of the whole population live in single rooms, and in Dundee there are 8,221 houses of one room containing 22,870 inhabitants. The chief reason for this seems to be that the occupants of the single-room tenements cannot afford to pay for more accommodation. The custom of the poorer classes in Scotch towns may have something to do with their mode of life, but it is probably for the most part a question of rent. In Edinburgh rents seem to be very high, and consequently they bear a large proportion to wages, and are said by one witness to amount to a fourth of the wages.

The Commissioners think that much could be done to mitigate the evil of the single-room system by raising the standard of cubic feet of air required for each individual, and by making provision that the standard should be vigorously enforced. The regulations as to underground dwellings should also be made more stringent. On the general question they have come to the conclusion that 'although the evidence shows a not very desirable state of things in the housing of the working classes in the towns of Scotland, yet on the whole the only persons to whom reform might be looked for—the representatives of the more active local authorities—are not discontented with the condition of affairs.' For instance, Dr. Littlejohn, the health officer of Edinburgh, and medical adviser of the Board of Supervision, expresses himself as satisfied with the state of the sanitary laws, and does not consider that more power is required under them, though he would like to see the single-room system done away with.

Sanitary Defects of Houses.—Much evidence was given by witnesses from large towns to the effect

that a considerable proportion of the labouring classes in Scotland would be able to house themselves in far greater comfort if it were not for the large sums they spend in drink. The dilapidated condition of many of the habitations of the poor is another great evil. In some of the old parts of Edinburgh there are houses which are too decayed to be repaired.

When clearances have been made accommodation has been supplied for the more respectable artisans, but the poorest section of the population have been left to inhabit the defective houses which remained. Structural defects are not found solely in old quarters of the towns. At Glasgow the custom of building houses in hollow squares was said to be a great evil, and the back-to-back system in the crowded courts was described as 'the curse of Glasgow.' Complaints were made of the insufficiency of water-closets; and the water supply generally is not so good as it should be. Evidence was given which showed that there is a sufficient supply of houses for the better class of the working population in Edinburgh, but that the wants of the very poor have not been met. The legal expenses, as in England, are found to be a great difficulty, especially in connection with the system of feus.

The Commissioners appear to think that the enactment of proper building by-laws, and the improvement of the present public health law, will be sufficient for the correction of these evils, though they recommend a reduction of the cost of the transfer of land and of small houses.

Improvements Effected in Large Towns, and their Results.—Most of the urban witnesses appear to have spoken to an improved state of things in the towns, and it may be well, therefore, to notice some of the figures showing the work which has been done to ameliorate the condition of the dwellings of the working classes. In Edinburgh the improvements made by the City Improvement Trust have cost the city 300,000*l.*, nearly 3,000 houses occupied by the poor having been cleared away. In Glasgow 1,600,000*l.* has been spent by the Improvement Trust since 1870, 80 acres have been purchased for clearance, and about 30,000 people have been displaced out of 50,000 whom it was intended to displace. At Aberdeen 800 people have been displaced under Cross's Acts, and at Greenock 2,000 people, houses having been provided for about 600 of those turned out. At Leith the Town Council have spent 100,000*l.* in doing so little that the Commissioners think that the Corporation should not be relieved of the obligations imposed upon them by law. At Dundee some of the worst quarters of the town have been demolished, but a good deal remains to be done. The general result of these operations is shown by the death-rates. At Edinburgh the average rate from 1866 to 1875 was 26.26 per 1,000; from 1876 to 1885 it was 19.94 per 1,000. At Glasgow the mean death-rate from 1861 to 1870 was 30.5 per 1,000, from 1871 to 1880 it was 28.5, and from 1881 to 1885, 26.5 per 1,000. At Dundee the average death-rate was 28.86 from 1864 to 1875, and from 1874 to 1884 only 21.09 per 1,000, 1874 being the date of the great demolition.

Rehousing after Demolition.—In connection with town improvements it is interesting to note the policy adopted in Scotland for rehousing the people who have been displaced by demolitions. In all the Scotch towns the general feeling is that there is no obligation to rehouse the people who have been turned out. The clerk to the Edinburgh City Im-

provement Trust thinks the work is best left to private enterprise, and in this way is most amply done. The President of the Edinburgh Trades Council, speaking for the working classes, holds that the Town Council ought not to be in any way responsible for the housing of the people. At Glasgow, it was said that if the Town Council had shown any tendency to build on their own account it would have paralysed the independent efforts of people outside. It is curious that at Glasgow the labouring classes crowd into the town, not in order to be near their work, as in London, but for the convenience of town lodgings. They often work in the country or on the outskirts of the town and return to sleep in the centre of Glasgow, thus adding needlessly to the overcrowded state of the place.

Rural Districts.—The Commissioners give a familiar picture of the hovel which serves for a dwelling-place of the cottier in rural districts. There is no need to reproduce it; most of our readers know it well enough in its dirt, darkness, and misery. A good deal of evidence as to Highland houses was given by members of the Crofters' Commission. The majority of cottiers' dwellings are described as confined, dark, miserable, and unhealthy. Some of them have only one entrance for the cattle and the human inhabitants; they have no partition inside, and all the occupants, human and animal, live under the same roof in the same undivided space. Many of them have no windows, and receive light only by the door and by the aperture through which the smoke escapes. The condition of the interior is, of course, filthy. This is the worst type of house which the Commissioners have found in Scotland, but it is a very common type among the crofter population. Lord Napier and Ettrick, the chairman of the Crofters' Commission, offered some suggestions for the improvement of these dwellings. The Royal Commissioners find themselves unable to concur with his recommendations, and observe that 'the condition of the crofters' and cottiers' houses seems to depend on the conditions of their tenure of land'—a subject beyond the purview of the Commission. Not only in the Highlands, but throughout the three kingdoms, does this question of land tenure perpetually crop up in connection with the problem of housing the poor. The case of dwellers in towns is perhaps the most pitiful and sordid, but the rural labourer has his own peculiar difficulties in the dwellings question. We cannot now reopen this particular point. Years ago we drew attention to the patent evils of the overcrowding and dilapidation of village homes, and to the need for reform.* Probably the great land question will be one of the first things to which the new Parliament will set its hand, and it will then be well to remember how intimately it is bound up with the proper housing of the poorer members of the community.

DYNAMITE AND APOPLEXY.—On the 29th ult. John Dawson, a miner employed in the lead mines at Wearhead, near Bishop Auckland, died of apoplexy. The deceased had often complained of faintness, arising from inhaling the fumes of dynamite used in lead mines; a few days previously he was seized with a fit which completely prostrated him and rendered him unconscious. The medical men in the district are unanimous in their opinion that the use of dynamite tends to produce this malady, which has carried off several miners.

* See SANITARY RECORD, Vol. viii. p. 305.

THE VISIT OF THE ROYAL COMMISSION ON HOUSING THE INDUSTRIAL CLASSES TO DUBLIN.

(FROM AN OCCASIONAL CORRESPONDENT.)

THE visit of the Royal Commission to Dublin was looked forward to with great hopes by those interested in the homes of the poor in that city.

Most persons in Dublin who have paid attention to the subject have come to the conclusion that the present condition of the dwellings of the industrial classes is due rather to defects of administration than of legislation, and the character of the Commission, as well as the nature of the report relating to England, encouraged the belief that the investigation would be thorough, and be based not only on the evidence of officials, but on the independent testimony of those of long experience on the subject.

The Commissioners who came to Dublin were Sir C. Dilke, Sir R. Cross, Mr. Stanley, Mr. Morley, Mr. Collings, and Mr. E. D. Gray.

They opened their sittings at the City Hall on Saturday morning, the 23rd ult., sat continuously until 7 o'clock P.M. that day, when they completed the inquiry as to Dublin, with the exception of three or four witnesses taken on Tuesday and Wednesday. The Commissioners were reinforced by the addition of Earl Brownlow and the Bishop of Bedford on Tuesday morning, when they sat from 12.15 to 5 p.m., and for 1½ hours on Wednesday, and concluded the investigation. During 15½ hours they examined forty witnesses, giving an average of nearly twenty-three minutes to each witness, thus easily beating the shortest time on record for Commissions of Inquiry.

The selection of witnesses was conducted on the most extraordinary principles, and if the object of those consulted on this subject by the Commissioners was to hoodwink that body it was attended with perfect success. The list of witnesses originally selected on behalf of the local authority excluded the City engineer, the assistant engineer, who is surveyor to the Artisans' Dwellings Committee, the law agent, and the consulting sanitary officer.

These are the only officials now surviving who had anything whatever to do with the clearance and reconstruction of the Coombe area, which was dealt with by the Corporation in 1876-80, under Sir R. Cross's Act, with most beneficial results (see SANITARY RECORD, Nov. 18, 1876). Although the City and assistant engineer were, owing to external pressure, called on at the last moment, the value of their evidence was altogether neutralised, owing to the mode of examination pursued. The official witnesses were taken in batches, and great was the competition in garrulity; he who talked most talked best, and some of the witnesses could not get a word in edgewise to express their assent or dissent.

Similarly as regards Kingstown, a suburb of Dublin, which can boast of slums quite as bad as those of the metropolis (see SANITARY RECORD for October 15, 1884, p. 167); the evidence of the medical officer of health, of an ex-chairman of the Commissioners of immense experience, of the agents of the lords of the soil, and of others intimately acquainted with the district, was declined, and that of a private medical practitioner, who had only come to Kingstown within the past two years, accepted.

The owners of tenement houses in Dublin, whose

number may be estimated from the fact that 180,000 of the population live in those houses, offered to send a representative to explain their views, but the offer was declined, and the Commissioners are absolutely without evidence as to the position and difficulties of this class. It is not too much to say that the Commissioners could have got a clearer idea of the cause of the present state of things in Dublin, and the difficulties in the way of their removal, from this body than any other witnesses examined. A grave error was also committed in not examining the dispensary medical officers of Dublin, who are also health officers of their districts. The experience of some of these gentlemen extends for over twenty years, and would have been most valuable.

The repression of evidence did not stop here. Many witnesses, both official and independent, were prepared to give the Commissioners their views on the subjects noted in their 'briefs,' but they were politely dismissed after the merest outline of their evidence was taken, and some brought from a great distance were asked two or three questions or not examined at all. The Cork witnesses publicly stated that they might as well have sent their evidence by post.

It was specially desirable that the condition of Cork should have been inquired into, as the Commissioners did not seem to form a favourable opinion of that city. The death-rate of Cork for the past five years (25.5) is lower than that of Dublin (27.3), and the most successful effort, financially, to house the industrial classes in the three kingdoms has been made in the former city.

It was not unreasonable that the Commissioners should have declined multiplied evidence as to the state of the slums, although it is unfortunate that the slums which they visited were by no means the worst in Dublin. But the condition of slums does not materially differ in different places, and the Commissioners had already description of facts *ad nauseam*, although it may be doubted whether they ascertained the three leading features of the slums of Dublin, viz., their presence in all parts of the city, their daily increase, and their rapid deterioration. They should, however, have laboured to ascertain the real causes why the owners of such dwellings do not improve them and the remedies for removing the obstacles in the way of that improvement. To refuse to hear the evidence of these owners, and not to seek suggestions from those who have acquaintance with the difficulties mentioned, was to ignore the very *raison d'être* of the Commission.

Dublin, of all the cities in the three kingdoms, affords perhaps the most satisfactory example of the application of Sir R. Cross's Act; but it stands no less high in the rank of those cities which need the effective administration of the laws relating to existing repairable structures, and is very unfavourably circumstanced both in the condition and administration of other laws which seriously affect the housing of the working classes. The state of house tenure, the laws relating to valuation and taxation, the recovery of rent, and eviction in case of non-payment, all contribute largely to the difficulties which handicap the improving owner, and tend to throw the ownership of tenement-houses into the hands of unscrupulous persons.

It is a matter of very great regret that fuller evidence on these subjects was not sought by the Commission, the more especially as it is almost certain that legislation will follow their recommendations.

has been always the fate of Ireland to suffer two classes of Select Committees or Royal Commissions—the superficial and the exhaustive; commendations of the former are recorded in statutes, while those of the latter are in most too strong for the existing Government to act.

DRAINAGE AND SEWAGE PURIFICATION IN THE BLACK COUNTRY.

(FROM OUR OWN CORRESPONDENT.)

[Fourth Article.]

DERABLE time was lost in dealing with the question of uniting Walsall and Wednesbury for sewage purposes, and to obviate the difficulty to be experienced by the former place in getting the necessary land for their purpose. The Wednesbury Local Board District was at the time wholly without any system of sewerage. Mr. the Walsall surveyor, who had been entrusted with the preparation of a scheme for the borough, was not likely to accrue to Wednesbury in getting Walsall to hold the land they required for sewage purposes, and in this he was supported by Mr. J. Marten, C.E., of Wolverhampton, an authority on drainage matters. Mr. Marten should recommend Wednesbury, if it went to a scheme on its own account, to go in for filtration rather than filtration, as being more suitable to its situation, and requiring but a few acres of land. In this respect, Wednesbury, having a system in vogue, could adopt any scheme it liked, whereas Walsall could not do with a precipitation system alone on account of having deep sewers already laid, in which they had to deal with water as well as with sewage matter. The Walsall people at first declined to consider in any way the proposition for a union of the two towns, but finally, in order to avoid a Parliamentary contest, got over the land difficulty, they agreed to consider the Wednesbury Local Board withdrawing their opposition to the provisional order asked for by Walsall, the latter as soon as practicable apply to the Local Government Board for a provisional order for joining the two places into a united district for the purpose of receiving, storing, disinfecting, distributing and otherwise disposing of the sewage of those places. The Wednesbury people, who were beginning at this time to feel uncomfortable as to their share in the pollution of the River Tame and its watercourses, eagerly closed with the terms offered by their Walsall neighbours, and negotiations were actually in progress as to the terms of agreement when the attention of the Wednesbury Local Board was directed to a statement relative to the system of sewage treatment in vogue at Farnworth and Astley Bridge, in Lancashire, which was said to almost perfect results at comparative small cost. A deputation was appointed to visit those places, and report to the Board upon the scheme. It was said the Board with this report that they had sent Mr. Fereday (surveyor to the Board) to prepare plans and specifications for dealing with the sewage by tank precipitation on the Astley Bridge and Farnworth principle. The question of union with Walsall was set aside: a result for which the

latter place was duly grateful. The opposition to the provisional order asked for by Walsall being thus withdrawn, sanction was given by the Local Government Board to the scheme propounded by Mr. Boys, and eventually it was carried into effect, at a total cost, including the purchase of land for a sewage farm, of about 53,000*l.*, so far as the town of Walsall was concerned. That portion of the scheme which related to Bloxwich was left in abeyance for a time, the sewage there being of a domestic character, without the addition of the deleterious matters which flowed into the Walsall sewers. It was not until the end of last year that a move was made in the direction of completing the sewerage of the district under control of the Corporation of Walsall. An inquiry was then held (Nov. 19) by Captain Hildyard, R.E., on behalf of the Local Government Board, respecting an application made by the Walsall Town Council for permission to borrow 26,850*l.* for the execution of the Bloxwich portion of the scheme. The system proposed to be adopted was one of filtration, and the cost, including land and farm buildings, was estimated at 32,000*l.*, a portion of which they had remaining from the loan obtained for the carrying out of the Walsall scheme. Captain Hildyard took occasion to compliment the authorities upon the successful results achieved at Walsall, and the purity of the effluent obtained from the Bescot Sewage Farm. Sanction being given for the loan required the Walsall people may be considered to have, with the completion of the Bloxwich scheme, discharged themselves of the obligations and responsibilities resting upon them in an able and satisfactory manner. As they were one of the first places in the district to move in the matter, so have they been one of the first to dispose of it, being in this respect considerably in advance of their neighbours.

Returning now to Wednesbury, we find that, in May 1882, the surveyor to the Local Board of that place presented a report based upon the Farnworth and Astley Bridge system, in which he recommended three different outfalls, at a cost of 20,921*l.*, exclusive of the cost of land and the payments for way-leave through mining property. The Board, after long and wearisome discussion, approved the report, but wisely decided, before committing themselves to any expenditure upon it, to submit the scheme to Mr. Marten, C.E., together with the plans prepared by Mr. Fereday. In August, 1882, Mr. Marten sent in his report, which was to the effect that for various reasons he did not consider the scheme as it stood would enable them to discharge their statutory obligations. He pointed out that in order to obtain a satisfactory effluent under a precipitation scheme it was absolutely necessary that, after being mixed with the precipitant, the sewage should remain perfectly quiescent for a much longer period than Mr. Fereday's scheme would permit. Neither did he think the 13 acres of land, or that portion of it which would be available for the purpose, proposed to be acquired, would be sufficient for the purification of the liquid from the precipitation tanks to a sufficient extent to be passed into the river. He considered at least eight acres of additional land would have to be provided; suggested that storm-water should be kept out of the deep sewers as much as possible, and that one outfall only should be used, instead of three, adding that, in his opinion, it would be advisable in their case to rely for the purification wholly upon some system of precipitation and sub-

sidence, rather than upon any system of intermittent downward filtration or broad irrigation. Including 20 per cent. for interest on the outlay, engineering expenses, and contingencies, he estimated the cost of a practicable scheme of sewerage for Wednesbury at 30,780*l*. In the face of this adverse report, the Local Board, by a majority, rejected Mr. Fereday's scheme. They were not able to let the matter rest, however, for the Birmingham Corporation had served them with statutory notice of proceedings under the Rivers Pollution Act, and it was urgently necessary that something should be done. At this juncture a proposal was made by the Local Board of Darlaston, an adjoining town, for the union of Wednesbury, Darlaston, and Tipton into a united drainage district for the purpose of carrying out a sewerage scheme which should include the three towns, which were equally devoid of any system of sewerage, and equally responsible in regard to the pollution of the Tame. Somewhat similar conditions as to scarcity of available and suitable land ruled each town, and they were also similarly circumstanced so far as the prevalence of mines and the consequent difficulty and expense of deep drainage was concerned. The proposal was favourably taken up by Wednesbury, and in October 1882 a conference of representatives of the three places was held, at which Mr. Edward Pritchard, C.E., attended as an expert on behalf of Darlaston. The result of the conference was the preparation of a report by Mr. Pritchard, in which he dealt with the drainage of the three towns and a portion of the Local Board district of Coseley, the whole forming a tolerably compact group. The population to be provided for he estimated at 5,000 for the portion of Coseley included in the scheme, 16,967 for Darlaston, 37,516 for Tipton, and 30,705 for Wednesbury, giving a total of 90,188, a number largely in excess of the then population of the respective places, which in 1881 was, independently of the Coseley contingent, 68,151. Mr. Pritchard proposed to acquire for the purpose of structural works and for sewage purification and utilisation 111 acres of land near Newton Road Station, on the Grand Junction Railway, near the Bescot sewage farm belonging to Walsall, to which land he considered the sewage of the district would flow by gravitation. The method of purification he proposed to adopt was to be a combination of deposit and straining in tanks, with intermittent filtration to follow. The cost to the respective places he estimated at, for Tipton, 32,000*l*.; Wednesbury, 28,000*l*.; Darlaston, 15,000*l*.; Coseley, 4,500*l*.; or an equivalent to 17*s*. 7½*d*. per head of the population to be provided for. This report, embodying the most favourable and beneficial scheme which had been laid before them, was accepted by the Wednesbury Local Board, who instructed their clerk to 'prepare a petition to the Local Government Board for the union of the districts of Wednesbury, Tipton, Darlaston, and part of the parish of Coseley, for the purpose of carrying into effect a system of sewerage for the use of all the said districts, in accordance with the terms of the Public Health Act of 1875.' The Darlaston Local Board also approved of the scheme of union laid down by Mr. Pritchard. The Tipton Board declined to give in their assent to it on the ground that they had the question of the drainage of the place under consideration, and wished to be free to adopt the most beneficial plan. The petition of the Wednesbury Board was duly presented, and in March of

the following year (1883) Mr. J. T. Harrison, M.I.C.E., attended, on behalf of the Local Government Board, to hold an inquiry into the matter. This inquiry lasted three days, and opened up matters too lengthy to be dealt with in this article.

HOUSE VENTILATION.

By G. H. BLAGROVE, A.R.I.B.A.

IT has often been said that the subject of house ventilation is but imperfectly understood by the public at large; and the fact is that the majority of people are apt to neglect it altogether or to mistake its object. Judging from phraseology in daily use, one might be led to imagine that the object of ventilation is to effect changes in the temperature, rather than the quality, of the air. 'The room is warm—open the window,' or 'the room is cold—light the fire,' are phrases in which the purity or impurity of the air seems regarded as of secondary importance; and we generally find that unless atmospheric impurities are sufficiently evident to offend the nose, they are disregarded altogether. Such being the attitude of the public upon this important question, it is left to architects, builders, and sanitary experts, to contrive methods of ventilation which shall operate effectually in houses, without unduly taxing the attention of the inmates. Some of these methods are successful, some only partially so, while others fail altogether; and too often the complaint is heard that the inmates themselves will persist in rendering abortive those expedients which have been provided for their own express benefit. It is time that householders at least should be no longer ignorant or indifferent upon a subject so closely affecting the health of the community; for whatever specialists may contrive to meet the case, efficient house ventilation must always depend mainly upon the inmates.

It is not to be supposed that ventilation is independent of temperature, or that the temperature of a room can be changed without in some degree promoting ventilation, however imperfect. A physician will order a fire to be lighted in a sick room, less for the purpose of warmth than to encourage ventilation. Heat causes air to expand and to become less dense, so that as the air of a room becomes heated, the colder and heavier air outside meets with less and less resistance in forcing its way down the chimney to fill the partial vacuum. Sometimes, in its downward progress, it carries some of the smoke with it, and this smoke may frequently be seen hanging in mid air, and apparently wanting an impetus to carry it up or down. This is because the smoke has been chilled by the downward rush of cold fresh air from without, and, being chilled, it has become condensed to about the same specific gravity as the air of the room. If every aperture could now be closed, to prevent the operation of disturbing currents, and if the atmosphere of the room were allowed to settle down to an equal temperature in every part, this smoke, together with the most vitiated part of the air, would gradually settle down in the lowest strata of the room, while the purest air would find its way to the top.

For carbonic acid gas, which is the most poisonous ingredient in ordinary air is, roughly speaking, about one-and-a-half times as heavy as what we ordinarily term pure air, so long as both are at the same temperature. It is only when heated, as it is when expelled from the lungs or thrown off by com-

n, that it can become sufficiently rarefied to the upper part of a room. This is usually the case, except when the atmosphere of a room comes so hot that there is not sufficient difference between its temperature and that of the cold air expelled by the lungs to enable the air to rise; in which case the pure air will find its way to the upper part of the room, while the cold air will be inhaled over again. It is conditions like these that render heated rooms injurious to health, rather than any effect produced by a high temperature upon the body.

We attempt to relieve the oppression of a room's atmosphere by opening ordinary windows, but this is instantly raised against draught—the impact of cold air upon the person when the window is open, which may produce catarrh, rheumatism, and other complaints. Recourse is, therefore, had to various devices for introducing fresh air into rooms without perceptible draught. Amongst these may be mentioned the old-fashioned ‘hopper’ ventilator, still to be seen in many of our churches and school-rooms. By it the in-rushing current of air gives an upward direction, after which it is allowed to diffuse itself, becoming gradually cooled by contact with the air of the room. A result is obtained by means of hinged top-lights above the windows, made to slope inwards when open, and furnished with side-gussets, to draw the air from passing downwards into the room.

With such arrangements as these, however, there is a constant down-draught, which makes it unpleasantly felt upon the heads of persons sitting beneath. The fresh air does not, in fact, receive the upward direction imparted to it on entering; but, being heavier than the air of the room, it is impelled downwards before it has had time to become warmed. Tobin's tubes are tolerably well known. By them the fresh air is given a downward direction on entering the room; and when the tubes are high enough, and the current sufficiently strong, the air spreads and diffuses itself on entering; in contact with the ceiling, and descends gradually, becoming warmed as it does so. Frequently, however, there is a draught to be felt when sitting near a Tobin tube, because the cold air fails to spread itself as soon as it enters the room. This may occur through the temperature of the room being very much higher than that of the external air, through the tubes not being high enough—should never be less than 6 feet high; but, so long as the upper part of a room remains considerably warmer than the lower part, a strong upward current will be maintained, and there will be little or no side-draughts.

A simple device for admitting a small amount of fresh air through a window without danger of draught is coming into general use, and deserves notice here. It consists in allowing an extra pane of glass to be raised on the sill of a window, so that the air can be raised for an inch or two without opening at the bottom, the air finding its way only between the meeting rails. This is done in a similar manner to the hopper ventilator, hinged light already described, only the result it produces is generally too trifling to be relied upon.

A great objection must be stated against all attempts for admitting fresh air in the upper part of a room, or for giving it an upward direction by means of Tobin tubes or other contrivances.

When the cold fresh air is brought suddenly into contact with the most impure portion of the atmosphere, which, as we have explained, is usually at the top, it chills it, condenses it, and brings it down. Thus, what would otherwise be a slow process—the condensation of the impure air—is greatly accelerated. There always will be a tendency for the pure and impure air to intermingle and to equalise their temperatures. It is quite erroneous to imagine that in order to ventilate a room we need only admit fresh air. By that we can only hope to dilute, not purify, the atmosphere, and it is exceedingly doubtful whether the atmosphere of most of our houses is ever completely changed from one year's end to another.

In all efficient schemes of ventilation the egress of the impure air is most essential. In ordinary houses no provision is made for this, for when the windows are closed there is usually no outlet above the level of the fireplace opening. This is often so low down in bedrooms that a person lying in bed is above it, and remains in the same unchanging atmosphere during the night. An outlet, to be of real service, should be placed at the highest part of the room—in the ceiling, if possible. If placed at any lower point there will exist a stratum of foul air down to that level, so long as the atmosphere remains heated; and this stratum of foul air will be a constant source of danger, as we have already explained. Having provided outlets, the next difficulty is to insure that the foul air shall find its exit through them, and not be checked in its course by the entrance of cold air from without. Sometimes the outlets are carried into a smoke flue, in which an upward current is established when there is a fire alight. We have also known a tube carried from an outlet in the ceiling through the thickness of the floor to an opening, provided with a sliding valve, in the fireplace of the room above. Here, also, heat was relied upon as an extractor. A number of mechanical extractors, which operate by means of revolving cowls, fans, and similar expedients, have been patented, and many of them are of great efficacy. Sometimes extraction flues are carried up in stacks in the same manner as smoke flues, except that the outlet openings, instead of being at the top, are usually placed at the side, and provided with gratings. We believe that they would act more effectually if placed at the top, where they would be better protected against gusts of cold air. We presume that the same conditions which are favourable to the emission of smoke are applicable to foul air, which is quite as easily checked in its upward course.

It is probable that if we provide for the extraction of foul air, a sufficient amount of pure air will find its way into an ordinary dwelling-house through chimney openings, doors, and other channels, and that by throwing all the windows wide open for about an hour during the day in winter, and longer in summer, we may dispense with special fresh air inlets in rooms. When, however, we can provide for warming the air by contact with hot-water pipes or other means, it is desirable to have a constant supply. In the ventilation of public buildings water-sprays and filters are often used for cleansing the air from organic impurities previously to its admission. Such contrivances would be considered complicated and unnecessary in an ordinary house, but such is the impurity of a town atmosphere that we cordially recommend their adoption wherever practicable.

THE REGISTRAR-GENERAL'S LAST QUARTERLY RETURN.

By J. HAMPDEN SHOVELLER.

THE Registrar-General has just issued his quarterly return of marriages, births, and deaths in England and Wales. The statistics relating to marriages are for the fourth quarter of last year, while those relating to births and deaths are for the three months ending March last. The marriage-rate showed a considerable decline from that recorded in the corresponding quarter of the preceding year; both the birth-rate and the death-rate were below their respective averages. The mean temperature during the quarter at the Royal Observatory, Greenwich, was $40^{\circ} \cdot 3$, and was $1^{\circ} \cdot 5$ above the average in the corresponding period of 112 years. The rainfall amounted to 5.26 inches, which was a quarter of an inch above the average amount in the first quarter of the preceding 68 years.

During the last three months of 1884 the marriages of 117,106 persons were registered in England and Wales, equal to an annual rate of 17.1 per 1,000 of the population, estimated by the Registrar-General to be twenty-seven and a half millions of persons. This marriage-rate was 1.4 below the mean rate in the corresponding quarters of the ten years 1874-83, and, with one exception, was lower than that in any of the ten preceding corresponding quarters.

The births registered in England and Wales during the first quarter of this year were 232,015, corresponding to an annual rate of 34.2 per 1,000 of the estimated population. This birth-rate, although showing an increase of 1.0 per 1,000 upon the low rate that prevailed in the first quarter of 1884, was 1.4 below the average rate in the corresponding quarter of the ten years 1875-84. In the several counties the birth-rates last quarter ranged from 28.7 in Shropshire and 29.2 in Westmorland, to 38.4 in Essex, and 38.8 in Staffordshire, in Nottinghamshire, and in Monmouthshire. The 232,015 births registered in England and Wales during the quarter under notice exceeded the deaths by 84,108; this represents the *natural* increase of the population. It appears from returns issued by the Board of Trade that 37,686 emigrants embarked during last quarter from the various ports of the United Kingdom at which emigration officers are stationed; excluding foreigners, and distributing those whose nationality was undistinguished, the emigrants of British origin were 30,748, including 20,901 English, 3,238 Scotch, and 6,609 Irish. The proportion of emigrants last quarter to a million of the respective populations of the three divisions of the United Kingdom were 760 from England, 829 from Scotland, and 1,344 from Ireland. Compared with the corresponding quarter of 1884, the proportion of emigration last quarter showed a decline in each of the three divisions of the United Kingdom.

From returns published by the Local Government Board it appears that the average number of paupers relieved on the last day of each week during the quarter ending March last was 736,406, of whom 189,718 received in-door and 546,688 out-door relief. The proportion of the population in receipt of pauper relief almost corresponded with that recorded in the corresponding quarter of 1884.

The deaths of 147,911 persons were registered in England and Wales during the first quarter of this

year, equal to an annual rate of 21.8 per 1,000 of the estimated population. This rate, although showing an increase of 2.3 upon the unprecedentedly low rate in the corresponding quarter of last year, was 1.0 per 1,000 below the average rate in the first quarters of the ten years 1875-84. In the various counties the rates ranged from 18.1 in Sussex, 18.2 in Rutlandshire, and 18.4 in Westmorland, to 24.8 in Oxfordshire, 25.4 in Bedfordshire, and 27.1 in Monmouthshire. In the principal urban districts, comprising the chief towns, and containing an estimated population of more than sixteen millions of persons, the rate of mortality last quarter was equal to 22.3 per 1,000; in the remaining and chiefly rural population of nearly eleven millions, the rate was 21.0. The urban rate was 1.8 below, while the rural rate was 0.1 above, the average rates in the ten preceding corresponding quarters. In equal numbers living, the deaths were 106 in the urban to 100 in the rural population.

In the twenty-eight great English towns, including London, and having an estimated population of nearly nine millions of persons, the deaths registered corresponded to an annual rate of 22.7 per 1,000, which was 0.4 above the general urban rate. While the death-rate in London did not exceed 21.6 per 1,000, it averaged 23.6 in the twenty-seven provincial towns, among which it ranged from 18.0 in Brighton, 18.6 in Derby and in Birkenhead, and 19.5 in Hull, to 28.2 in Manchester, 30.1 in Preston, 32.9 in Cardiff, and 33.9 in Sunderland. The rates of mortality at different ages in the twenty-eight towns showed the usual wide divergencies; the death-rate among infants, measured by the proportion of deaths under one year of age to 1,000 births registered, ranged from 101 in Brighton to 218 in Cardiff. The rate of mortality among persons aged between one and sixty years did not exceed 9.6 in Derby, whereas it was equal to 23.5 in Sunderland; and among persons aged upwards of sixty years the death-rates ranged from 75.2 in Hull to 117.6 in Manchester.

The 147,911 deaths in England and Wales last quarter included 33,352 of infants under one year of age, 70,335 of children and adults aged between one and sixty years, and 42,224 of persons aged upwards of sixty years. Infant mortality was equal to 144 per 1,000 births, and was slightly below the average in the ten preceding corresponding quarters. In the twenty-eight towns the proportion of infant mortality also averaged 144 per 1,000; it was 133 in London, whereas it was 152 in the aggregate of the twenty-seven provincial towns, among which it ranged from 101 in Brighton, and 107 in Wolverhampton, to 186 in Sunderland, 187 in Preston, and 218 in Cardiff. Among persons aged between one and sixty years the rate of mortality last quarter was below the average, while among elderly persons it showed a slight excess.

The deaths registered in England and Wales during the quarter ending March last included 13,308 which were referred to the principal zymotic diseases; of these, 3,413 resulted from whooping-cough, 3,094 from measles, 1,744 from scarlet fever, 1,433 from fever, 1,384 from diarrhoea, 1,156 from diphtheria, and 1,084 from small-pox. These 13,308 deaths were equal to an annual rate of 1.96 per 1,000, against an average rate of 2.44 in the ten preceding corresponding quarters. The zymotic rate in the twenty-eight towns last quarter averaged 2.34 per 1,000, and ranged from 0.53 in Brighton and 0.81 in Derby to 3.87 in Norwich, 3.93 in New-

upon-Tyne, 8·81 in Cardiff, and 11·69 in Sun-
L. In fifty other town districts this zymotic
eraged 2·04 per 1,000, while in the remaining
l parts of the country it was 1·73.

oping-cough was the most fatal zymotic
in England and Wales during the quarter
notice; the 3,413 deaths referred to this
were equal to an annual rate of 0·50 per
which was below the average rate in the
onding quarters of the ten preceding years.
twenty-eight towns the highest whooping-
rates were recorded in Wolverhampton,
and Preston. Among the fifty towns the
rates of mortality from this disease were
d in Ipswich, Walsall, and Middlesbrough.
94 fatal cases of measles were equal to an
rate of 0·46 per 1,000, which considerably
ed the average rate. In the twenty-eight
he rate of mortality from measles was 0·63,
s excessively high in Cardiff and in Sunder-
Among the fifty towns the highest measles
ates were recorded in Middlesbrough, St.
, and Newport. The rate of mortality from
fever did not exceed 0·26 per 1,000 last
; and was less than half the average rate for
t quarter of the ten preceding years. In the
eight towns the death-rate from scarlet fever
6 (corresponding with the general English
ut was somewhat excessive in Preston, Wol-
pton, and Halifax. Among the fifty towns
lity of this disease was proportionally highest
e-upon-Trent and Wigan. The 1,433 deaths
d to 'fever' (principally enteric) corresponded
annual rate of 0·21 per 1,000, and was con-

siderably below the average. The 'fever' death-
rate in the twenty-eight large towns also averaged
0·21 per 1,000; the highest rates were recorded in
Preston, Newcastle-upon-Tyne, and Norwich. In
the fifty other large towns the rate of mortality from
'fever' averaged 0·23 per 1,000, and was highest in
Barrow-in-Furness, Ystradyfodwg, and Yarmouth.
The mortality from diarrhoea during the quarter was
below the average. The death-rate from diphtheria
was 0·17 per 1,000, which exceeded the average;
among the large towns this disease showed the
highest proportional fatality in Liverpool, Ports-
mouth, Cardiff, Southport, and Chatham. Of the
1,084 deaths from small-pox recorded in England
and Wales during last quarter, 547 belonged to
Registration London, and 291 (including 211 in
West Ham) to the Metropolitan Outer Ring. The
246 deaths in the rest of England and Wales in-
cluded 34 in Taunton, 30 in Liverpool and surround-
ing districts, 22 in Chepstow, 10 in Manchester, and
6 in Sunderland.

The causes of 134,980, or 91·2 per cent., of the
147,911 deaths in England and Wales last quarter
were certified by registered medical practitioners;
and 7,502, or 5·1 per cent., by coroners in inquest
cases. The causes of the remaining 5,429, or 3·7
per cent. of the deaths, were uncertified. In London
the proportion of uncertified deaths was only 1·3 per
cent., whereas it averaged 4·1 per cent. in the rest of
England and Wales. In the twenty-seven provin-
cial towns the proportion of uncertified deaths
averaged 3·3 per cent., and ranged from 0·7 and 0·8
in Plymouth and Leicester, to 6·0 in Halifax and 8·9
in Oldham.

*of the Vital and Mortal Statistics of the Twenty-eight Great Towns, dealt with in the Registrar-General's
Weekly Returns, for the First Quarter of 1885.*

Towns.	Estimated Popu- lation middle of 1885.	Births.	Deaths.	Annual Rate per 1,000 Living.			Deaths from Principal Zymotic Diseases.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping-cough.	Fever.	Diarrhoea.	Rate per cent. of Uncertified Deaths.	Deaths of Infants under one year of age to 1,000 Births.
				Births.	Deaths.	Principal Zymotic Diseases.										
London	8,906,446	78,333	50,323	35·3	22·7	2·3	5,184	438	1,398	586	396	1,505	471	390	2·5	144
Manchester	4,822,518	43,171	28,350	35·9	23·6	2·5	3,026	56	908	394	194	898	319	257	3·3	152
Birmingham	4,083,928	35,162	21,973	34·6	21·6	2·1	2,158	382	490	192	202	607	152	133	1·3	133
Leeds	114,672	812	515	28·4	18·0	0·5	15	1	5	4	2	2	2	1	1·6	101
Sheffield	134,659	1,233	690	36·8	20·6	1·3	43	—	7	2	13	4	8	9	2·2	116
Bradford	91,215	814	615	35·8	27·1	3·9	88	—	—	4	5	30	42	7	1·8	150
Liverpool	76,045	601	449	31·7	25·7	1·5	28	—	1	3	5	12	6	1	0·7	130
Nottingham	218,169	1,773	1,356	31·6	24·9	3·5	192	—	58	15	10	97	3	9	1·2	170
Wolverhampton	79,185	747	481	37·9	24·4	2·8	56	—	1	17	4	27	3	4	2·5	107
Cardiff	427,769	3,782	2,347	35·5	22·0	2·1	220	12	12	8	13	130	19	26	2·5	150
Southampton	136,147	1,232	755	36·3	22·3	2·5	86	—	37	16	1	21	2	9	0·8	175
London (Outer Ring)	211,424	2,071	1,175	39·3	22·3	1·6	86	—	1	7	13	47	8	10	1·6	159
Halifax	89,691	834	416	37·3	18·6	0·8	18	—	4	1	—	2	8	3	2·2	110
Oldham	93,093	797	411	34·4	18·6	1·1	25	1	11	3	3	5	1	1	4·6	122
Sheffield (Inner)	579,724	5,069	3,683	35·1	23·5	2·7	387	15	112	51	46	26	36	41	5·7	156
Sheffield (Outer)	110,085	1,052	647	38·4	23·0	1·4	39	1	13	1	3	4	5	12	1·9	128
Sheffield (Total)	337,342	2,307	1,307	38·5	28·2	2·1	179	10	43	18	6	67	23	12	1·9	162
Sheffield (Inner & Outer)	204,075	1,834	1,052	36·1	20·7	1·8	91	—	3	18	6	39	10	15	4·0	130
Sheffield (Inner & Outer)	126,390	820	37·5	37·5	26·0	1·8	56	—	—	6	3	37	7	3	8·9	181
Sheffield (Inner & Outer)	112,574	1,046	647	37·3	23·1	1·4	39	—	5	19	4	48	11	7	4·5	187
Sheffield (Inner & Outer)	100,406	1,009	753	40·3	30·1	3·8	94	—	35	1	—	1	4	2	5·1	168
Sheffield (Inner & Outer)	87,327	684	489	31·4	22·5	2·0	43	—	—	—	—	3	3	3	6·0	139
Sheffield (Inner & Outer)	77,378	562	430	29·0	22·3	1·7	38	2	8	13	9	47	12	7	2·2	151
Sheffield (Inner & Outer)	214,431	1,578	1,063	29·5	19·9	1·8	168	1	1	58	10	71	16	11	2·7	147
Sheffield (Inner & Outer)	333,139	2,931	1,763	35·3	21·3	2·0	168	1	1	58	10	71	16	11	2·7	147
Sheffield (Inner & Outer)	305,716	2,876	1,612	37·8	21·2	1·9	148	2	30	12	5	48	28	3	5·8	137
Sheffield (Inner & Outer)	186,292	1,579	905	34·0	19·5	1·4	67	—	13	12	3	10	13	16	5·0	148
Sheffield (Inner & Outer)	125,327	1,232	1,059	39·5	33·9	11·7	305	6	307	22	4	11	8	7	2·8	186
Sheffield (Inner & Outer)	153,209	1,518	1,015	39·8	27·1	3·9	150	3	57	22	9	18	25	10	2·9	167
Newcastle-upon-Tyne	97,034	1,093	795	45·2	32·9	8·8	213	2	149	7	12	29	5	9	1·9	218

THE
SANITARY RECORD:

JUNE 15, 1885.

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The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

Local Authorities throughout the country would confer a favour on the EDITOR of the SANITARY RECORD by forwarding to him all documents relative to Water-supply, Sanitation, and Health matters generally, which come under their notice. He would also be glad to receive reports from Engineers of Waterworks, Sewerage Projects, and Domestic Drainage Improvements for notice, comment, and illustration.

The Editor would also feel obliged if Subscribers would favour him with particulars concerning any Societies or Companies or other organisations for Improving the Dwellings of the Poor with which they may be acquainted.

THE ETHICS OF METROPOLITAN
DUST-BINS.

NOT a specially fascinating subject truly, but one which, through the medium of the columns of the *Times*, has been engaging the attention of newspaper readers during the last month, as it engages the attention of thousands of householders all the long year through. It is significant of the importance with which practical sanitary questions are regarded by the lay press, that it is only in holiday times and in the dead season that there is any chance of their getting a hearing. For the enthusiastic sanitarian the columns of the leading daily paper have, during this blessed Whitsuntide, been a perfect Elysium: the broad and brutal fact being that the conductors of that journal, being unusually hard up for material, bethought themselves that the printing of a letter on the recondite subject of dust-bins would be sure to start an animated correspondence. And so, in truth, it did, though whether we are any better off, and any of us have got a clearer idea of the respective responsibilities of the local authority and the householder on the question, is open to doubt. To the insider, if we may arrogate to ourselves so presumptuous a title, these periodical sanitary paroxysms of the *cacoethes scribendi* are not a little amusing. The columns of the *Times* are the orthodox receptacle for the outpourings of the aggrieved householder's vials of wrath. Every day of his life the editor has to harden his heart against the thousand and one abuses which he is invited to pulverise with the sledge-hammer of his

powerful pen. One day he relents, and lets in a specimen of the letters which diurnally swell his waste-basket. The result is electric. Hundreds of communications from all sources pour into Printing House Square, and unless the editor promptly sits upon the safety-valve, his life is a burden to him until some other question crops up which monopolises the available space, and strangles the controversy in its early and promising youth.

There was about this time last year a highly instructive paper-war on the subject of house drainage. It raged furiously for a time, and then was suddenly extinguished. House drainage is as bad as ever, but no one now writes to the papers about it, or, at least, no letter sees the light. The subject for our Whitsuntide distraction of this year was not dissimilar. We were invited to reform our metropolitan system of 'dust-bins,' and successive correspondents descended upon one and another phase of the question in terms so eloquent that phlegmatic John Bull had quite made up his mind that 'something must be done'—when the roar of Parliamentary debate began again, and domestic topics were forthwith clean forgotten.

Looking at this matter soberly and in earnest, and reflecting at leisure upon the eddies in the stagnant pool of metropolitan public opinion which the recent correspondence has excited, it is impossible not to be struck with the very general misconception which exists as to the respective (1) moral and (2) legal shares of the local authority and the householder respectively in the removal of 'matter in the wrong place.' Some letter-writers would impose very stringent and elaborate functions upon the local authority—functions which would involve a considerable increase of the rates, at the amount of which the householder even now periodically winces. Others again desire to cast all sorts of disabilities upon the householder if his cook or scullery-maid do not cremate all the refuse of his establishment, and leave nothing but dry and innocuous dust for the scavenger to clear away. And every one, without exception, and including even that eminent functionary the editor of the *Times* himself, has misapprehended and misconstrued the present metropolitan law on the subject. So that there may be advantage in our setting forth in order the actual legal enactments which now exist for the protection of the householder, and in indicating as briefly as may be the practical common-sense view of the question. The first part of this duty we fulfil this month in the legal article as to dust-bins on page 551; the second part, as to the needful reforms in metropolitan scavengering, we are obliged, by lack of space, to hold over until next month.

MESSRS. STEVEN BROS. & CO., Architectural, Sanitary and General Ironfounders, 35 and 36 Upper Thames Street, have secured the lease of new and extensive premises at 4 Upper Thames Street (opposite the *Times* Office, Queen Victoria Street), and when the extensive alterations are completed, they will be able to have on show the largest stock in London of baths and fittings, ranges, slow-combustion stoves, marble chimney-pieces, marble kerbs, tiles and tile hearths, stable fittings, ornamental gates, railings, verandahs, hot-water fittings, &c. Owing to the large and increasing demand for their manufactures, it has become absolutely necessary for them to remove their enormous stock to warehouses where it may be seen to better advantage than has hitherto been the case, owing to want of space at their present address.

BURIAL SOCIETIES INSURANCE.

IN accordance with a wish expressed at the end of the leader on this subject in THE SANITARY RECORD of May 15, page 508, the editor wrote to Mr. Farrow for the desired information. His reply is as follows.

'The Leek Burial Society consists of 8,463 members. It is purely a local society, managed by a committee of eleven persons, who have a personal knowledge of almost every family in the town. Every proposal is laid before this committee (see enclosed proposal form). Illegitimate infants are only admitted after a great deal of consideration. Proper attention is also paid to paragraph 3 of Rule 7 enclosed.

'In 1876 this society discontinued the insurance of infants under the age of one year, and in 1877 the rate of infant mortality (0—1) for the whole population of the town, fell down to 109 per 1,000 infants living, the lowest rate recorded since 1850, when in steps a number of insurance agents vigorously canvassing for infant insurance. The local society then came to the conclusion that it would be desirable to recommence infant insurance in order to maintain its position. At the present time, in addition to the local society's agents, there are at least twelve agents employed by other insurance offices.

'The rate of infant mortality of the town having risen to 186 in 1,000 in 1884, the medical officer of health and myself deemed it advisable to inquire into the subject. The local society allowed me free access to their books, which I carefully examined. The following is an abstract of the results. During the five years 1880—84, 1,188 infants under one year of age were admitted. The number of lapsed policies of infants under the age of one year during the same period was 70, and the number of deaths of infants under the age of one year was 105, for the same five years.

'It is therefore clear that, including the lapses, the rate of infant mortality in this society was 88 in 1,000; and, including half the lapses, it was 91 in 1,000, and, excluding the lapses altogether, it was 93 in 1,000.

'During the same five years (1880—84) the infant mortality (0-1) was 163 in 1,000, in the whole town.'

Our correspondent's letter is an acceptable contribution to the important subject of infant assurance, but does not afford any corroboration of the assertion that the death-rate of assured infants in Leek is below the average death-rate of infants in the whole of the urban sanitary district of Leek. It must be borne in mind that the rate of mortality of infants shows remarkable variations during the first year of life. The annual rate ranges, according to Dr. Farr's English Life Table, from 571 per 1,000 in the first month to 92 per 1,000 in the twelfth. It follows, therefore, that, before the true death-rate of the infants assured in the Leek Burial Society can be correctly calculated, it is necessary to know the precise ages in weeks or months at which each infant was assured. In many societies no infant may be assured under the age of one month; and although the Leek Society appears to have no such rule, it seems improbable that many are assured under that age. Now, the exclusion of infants under one month would at once reduce the rate of mortality by nearly a third. Moreover, it must be remembered that infants, in a burial society,

are assured at all ages up to eleven and a half months, and that the form of calculation adopted by our correspondent assumes that they had all been exposed to a year's risk of death. Therefore there are two important sources of error in our correspondent's figures, both of which tend to understate the rate of mortality of the assured infants, and to destroy its value for comparison with the rate among all infants. In the first place there is no evidence as to the precise age of the infants when assured, and in order that their mortality should be comparable with that of all infants, the assurance should take place at the instant of birth. In the second place, it is evident from our correspondent's letter that no correction has been made in the calculation of the rate of mortality for the undoubted fact that very few, if any, of the assured children were actually assured at birth and throughout the whole of the first year of life. These sources of error have affected all the published rates of mortality among assured children that have come under our notice. It is interesting and important to know that, according to our correspondent's figures, about half the infants born in Leek during the past five years have been assured in this local burial society. Accurate statistics of the mortality among these infants become all the more important and desirable.

NOTES OF THE MONTH.**VENTILATION OF SEWERS.**

MR. WEAVER having very ably advocated the plan (by no means a new one) of using the ordinary sewer ventilators in the roads as *inlets* of fresh air, and every house-drain and soil-pipe as an extractor of foul air, various objections have been urged against this proposal, notably by Mr. Buchan. The following letter from Dr. Alfred Carpenter (appearing in the *Journal of the Society of Arts* for May 8) should be read by all interested in the subject, for although it may not cover the whole of the objections, yet, as far as it goes, it appears to us to be conclusive:—

'It is always difficult in a limited discussion to explain every point so as to avoid giving rise to misapprehension. I am quite in accord with Mr. Buchan on some of his points. I quite agree with him as to the prudence of the course which he advocates in certain given instances. It is a way to prevent the evil which may arise from defective works and bad engineering. It will prevent evil to a given house when the house-owner is helpless, as against the crass immovability of a satisfied municipality when the authority is content to allow sewers of deposit (elongated cesspools) to exist in populous centres, and even in ordinary urban communities; but, nevertheless, it is not in the abstract a right proceeding, it is not strictly sanitary work, it is not natural. If a sewer flushes clean, as it ought to do; if it does not become the habitat of sewage confervoid growths upon its invert—that is, if it is regularly scoured above as well as below the line at which the sewage ordinarily falls; if there is nothing to intercept the passage of sewage from its origin to its departure at the outlet: then there will be no sewer gas, there will be no stink, there will be no danger to anybody.

'The openings on the inverts of the arch of the street sewer will be inlets for fresh air, and the

ventilators produced by the extension of the soil-pipe of every water-closet above the level of the house-top will be outlets for the air which has passed through the sewer. Thus a constant circulation will be promoted at all times by the ordinary laws which belong to gases, and which by their very nature prohibit stagnation in fluids of all kinds. Occasionally there may be down draughts, but they will be of no more movement than the down draughts through an ordinary chimney—indeed, they will be as infrequent as a down draught into a furnace when the fire is low. Fresh sewage is not dangerous to anybody; but if it is kept within the curtilage of the dwelling-house by means of interceptors, or if it be allowed to stagnate in a badly constructed sewer until fermentative changes have arisen within its substance, it then produces the chance of evil; but in the present day no authority ought to be allowed to keep sewage within its borders until such a change has taken place. It should be "moved on" out of range as rapidly as possible. The dangers which Mr. Buchan proposes to obviate are really increased by his interceptors. The house is the unit of sanitary work; and it is wrong for selfishness to assert itself so as to determine that no man shall assist the local authorities in its duty to provide for sewer ventilation.

'I utterly object to the principle which is being tried to be established by various supposed authorities—viz., that the duties of the individual are antagonistic to the duties of the local authority in the matter of sewers. If each unit does his part, the duty of the local authority as to ventilation is simple. The latter has to convey away the sewage, and provide inlets for fresh air. The outlets must be at the highest points, and if they are so placed there will not be a particle of danger from the production of sewer gas. An authority has an important duty to perform—viz., to prevent the production of sewer air as a major part of its work. The provision for its escape, if it does accidentally form, will be best met by details in the construction of the house-drain. Concentration should not take place, and without concentration sewer gas is perfectly harmless. There will be no diffusion of enthetic germs, for they cannot live in fresh air long enough to spread infective disease; and if, perchance, a few should be discharged in the higher regions above the heads of a great or small community they die in a very few seconds.

'The germs which reproduce enthetic disease cannot live in fresh air, any more than a fish can live in unaerated water. If discharged, they should be diffused above the heads of the people, and not at the street level. These are my reasons for advocating the extension of every soil-pipe, so that each water-closet has a ventilator in action, and by this means properly constructed sewers will admit fresh air at the street level; and under common conditions, foul air (if produced) will escape, where it will fail to set up even the smallest possible danger. I advocated this principle twenty years ago, and experience (since my first paper upon this subject) has amply proved that I am right.'

SMALL-POX IN LEICESTER.

A MISLEADING paragraph has been going the round of the press, in which it is sought to connect the limitation of small-pox at Leicester with the anti-

vaccination proclivities of the population. It is undoubtedly true that three distinct outbreaks were reported in the town last year (the infection in each instance being conveyed from London), and that the disease did not spread on either occasion. But this was owing to the immediate removal of all the inmates of each house in which the disease appeared to the Fever Hospital, together with the thorough disinfection and lime-washing of the infected houses, and the further spread of the disease was arrested. Dr. Johnston remarks, in his annual report, that during the last eight years there have been no fewer than twenty importations of small-pox into the town and its immediate neighbourhood. The disease has, however, always been stamped out owing to the fact that the Health Committee have always succeeded in promptly removing to hospital, not only those stricken with the malady, but also all the other inmates of each infected house. This is certainly a very fortunate circumstance; but to base upon it the argument that vaccination is of no avail as a prophylactic is characteristic of the logical methods which are peculiar to the anti-vaccinators.

SANITARY CERTIFICATES FOR HOTELS.

WE are very glad to notice the extension of the system of municipal certification and inspection of the sanitary condition of hotels and lodging-houses in places of seaside resort. Scarborough has adopted such a plan with marked success, and the charmingly situated little town of Shanklin, in the Isle of Wight, has now followed suit at the instigation of the newly appointed and active health officer, Dr. Dabbs. In his first annual report, Dr. Dabbs observes that the sanitary work of 1884 has been very considerable, for he had to start the system of properly certificating houses and hotels. Up to the present date he has been very fairly successful in inducing the lodging-house keepers to consent to such examinations of their houses, and he trusts that before his next annual report the majority of the lodging-houses will have seen the necessity and real economy of the system.

THE NOTIFICATION OF CASES OF MEASLES.

IT is commonly held, and is no doubt the fact, that in measles large quantities of poison are given off for two or three days from a child affected by measles, before any rash appears on his body to indicate the nature of his illness. To ask for the notification of cases of measles to the health officer has therefore been regarded as of little avail for preventive purposes; and inasmuch as very many cases of measles occur during an epidemic, the sanitary authorities of those towns which have local Acts compelling the notification of infectious disease have, as a rule, declined to go to the heavy expense of paying medical men for a great number of certificates of measles, which would be chiefly useful for statistical purposes only. It is somewhat of a revelation, therefore, to find a health officer of one large town (Derby) speaking in favourable terms of the preventive results of the notification of measles, and to listen to one of the most capable of 'combined' medical officers of health (Mr. Fosbrooke, of Stratford-upon-Avon) demanding such notification as the only means of checking the disease. Mr. Iliffe says that, in view of the increase in the severity of measles, it was decided, early in January 1884, to

t the medical men of Derby to certify cases of disease to the sanitary authority in the same way as they have to do in the case of other diseases under the local Act of 1879. So well was this Act acceded to, that between January 9 and January 25 no less than 362 certificates were received, covering 513 cases. The knowledge of the whereabouts of the cases being thus obtained, the sanitary authorities were enabled to visit the houses affected, to put a stop to practices conducive to spreading the disease, that were constantly going on—such as children going to school from infected houses and playing in the streets and courts with the rash on a full bloom. The evils and dangers likely to arise from visiting and receiving visitors were likewise pointed out, and instructions with regard to disinfection and cleansing of clothing, &c., given. Mr. Fosbroke seems to be more or less of the opinion that the unchecked spread of measles in the district last year, and remarks that 'until the authorities are compelled to register all cases of disease immediately they appear, so long will sanitary authorities be almost powerless to prevent this kind of trouble from frequently assuming extended proportions.' No doubt the upspringing of measles in part of a town is terribly baffling to those who are desirous of its suppression; and if they could only have the power of learning of every case as soon as it is recognised, it would be a great advantage to sanitary officials. But what is chiefly wanted is the education of the population at large to detect the local landmarks of each disease affecting the neighbourhood. This can best be done by the distribution of handbills by philanthropic persons who have an interest in the domestic economy of the neighbourhood and are willing to instruct them how to order themselves. The premonitory symptoms of measles, understood by parents, would teach them the necessity of keeping the affected child from school, of giving him a warm room, until the characteristic rash appears. Similarly, school teachers could be instructed if they saw a child wheezy, feverish, and so on, to send him back home before he had time to infect his fellow-scholars.

METROPOLITAN PUBLIC GARDENS ASSOCIATION.

THE opening of this association was held by permission of Lord Brabazon, the chairman, at 83 Lancaster Road on the 2nd inst., when there was a large attendance of members. The secretary announced that Mr. Levin and Melville had promised to pay for laying out of the ground attached to St. Paul's and Schools, Rotherhithe, and that a lady had given 500*l.* for the improvement of the disused ground adjoining St. Peter's, Walworth. Lord Brabazon reported the victory gained by the association in the House of Commons in connection with the proposed recreation-ground in the Isle of Dogs, necessary permission having been obtained, it being agreed to lay out the disused burial-grounds of St. Mary's, Bermondsey, and St. Mary-le-Strand, the ground attached to St. Philip's, Old Kent, for the use of the public, and it was announced that the offer of help in this direction had been made by the owners of six other burial-grounds and three gardens. The Rev. J. Johnston and Mr. G. Johnston brought before the meeting their need of assistance in the promotion of the schemes for providing a park for Kilburn and a recreation-ground

for Upper Norwood. Among the new subjects considered by the members were the planting of trees in Finchley New Road, Stamford Hill, Kirkdale, Sydenham, and the streets of Rotherhithe; the placing of seats in Brompton Road, the covered Mill Pond, Rotherhithe, Union Square, S.E., and the triangles at St. John's Wood and Hackney; and the laying-out of St. George's disused burial-ground, Battersea. It was announced that three or four public gardens would be opened by the Association during June.

JUBILEE OF THE STATISTICAL SOCIETY.

THE Statistical Society, one of the oldest and most useful of the learned societies that now overspread the universe, is celebrating its jubilee this month. It was originally founded on March 15, 1834, and of its original members only six, one of whom is our esteemed and venerable friend, Mr. Edwin Chadwick, have survived to celebrate its jubilee. In its time the Society was a power in the world of science, and it had in its ranks some of the best and acutest of nineteenth-century thinkers. The inroad of new societies, conducted with more spirit and on less old-fashioned lines, has sadly marred in recent years the interest in the Society's discussions, which are usually very stilted, not to say humdrum. But there has of late been a very considerable accession of new members, raising the total number to nearly a thousand, and it is to be hoped that this will infuse some much-needed vitality into the present Executive Committee of the Society. It was at first intended to celebrate the jubilee last year at the International Health Exhibition; but the death of the Duke of Albany is stated in the last report of the Council to have 'impeded the execution of this design.' Arrangements have now, however, been made for holding the jubilee on the 22nd, 23rd, and 24th inst., at the London University and elsewhere. The President of the year is Sir Rawson W. Rawson, K.C.M.G., C.B., who was elected a member in 1835, and has been in his time one of the most diligent of paper-readers before the Society. There is, perhaps, a special fitness in a gentleman with fifty years of statistical experience being President of the jubilee, but it seems a pity that some one of greater fame as a statistician than Sir Rawson Rawson (Mr. Goschen, for preference, though other names might be mentioned), could not have been induced to do the honours of English statistical science before the very numerous foreign guests who, we understand, are expected on this interesting occasion.

THE WATER SUPPLY AND DRAINAGE OF OXFORD.

AFTER a good many years of inaction, the local authorities of our University towns appear to have been at last stirred up to a sense of the importance of putting the sanitary arrangements of their districts upon a reasonably sound basis. A Provisional Order Bill, which has just received the Royal assent, gives power for the acquisition of a sewage farm for dealing with the sewage of Cambridge, and cleansing the river from the foulness which University men describe as 'unspeakable.' Oxford has hardly got so far as this; and all its high academic machinery seems to be required before even a commencement of sanitary reform can be made. We confess we cannot understand how, in matters coming directly

within the duties of the local authority, it should be necessary or even desirable to appeal for public subscriptions to defray the cost of the necessary works. But an University city is an exceptional place, and is apparently free to do as it thinks proper. Some time ago a circular was issued by the Oxford Valley Drainage Committee, signed, among others, by Professor Jowett (the Vice-Chancellor of the University), Mr. Alderman Hughes (Mayor of the city), and Dr. H. G. Liddell (Dean of Christ Church), explaining the nature of the works and inviting subscriptions. The Thames Valley Drainage Commissioners have undertaken to carry out the whole of the works which are involved in the removal of Iffley Lock, upon condition of their receiving a sum of not less than 14,000*l.*; and it was proposed accordingly that at least 18,000*l.* should be raised towards the completion of the whole plan, in which are included both the increase and improvement of the water supply, and also the drainage of the valley. A memorandum by the Dean of Christ Church states that if the Colleges would agree to contribute from 3,000*l.* to 4,000*l.* annually (that is, from about 150*l.* to 200*l.* each on the average) for three years, it was hoped that, with contributions from the University and city, and from the two boards which control the drainage of the valley, the requisite sum would be forthcoming. It is understood that the committee have got money and promises of money enough to do all the works contemplated; but the weak part of the situation is that the contribution by the city is conditional on the University helping the waterworks, and the College contributions are, some of them, conditional on the city doing a fair share towards the drainage. Apparently the city cares more about the waterworks, and the Colleges more about the drainage. It is earnestly to be hoped that this scheme, so important in relation to the health of the towns of the valley, and especially the University and Colleges, may not, after all that has been done, break down now through the jealousy and mutual distrust of town and gown.

FACTORY INSPECTION.

THERE was a not uninteresting debate in the House of Commons on its first sitting after the Whitsuntide holidays with reference to accidents in factories and the need for increased factory inspection. The importance of the first part of the case is undeniable; the economic justification of the second is open to question. For if, as Mr. Broadhurst contended, the fifty new inspectors which he would like to see appointed, could very well be taken from the ranks of the more intelligent working men, who would be contented with a salary of not more than 100*l.* to 150*l.* a year, does not this imply that the working man has even now quite sufficient acquaintance with the Factory Acts to take of his own motion the steps which will lead to a reform in the conditions under which he has to work? It would not do to press this argument too far; but it is easier to cry out for more inspectors than to show what improvements in the condition of the workpeople are likely to result from an increase in the inspectorate. The everyday working of a factory cannot be appreciated by an inspector in a more or less cursory and infrequent visit so well as by workpeople who spend their lives in the place. What appears to be required is not so much more inspection from Whitehall as the giving of power to the local governing body to make speedy

inquiry into any complaint of insanitary conditions or want of ventilation, or overwork, or dangerous machinery in the case of all factories, including in this term all assemblages of workpeople. Notwithstanding the increases that are perpetually being made in the staff of the Factory Department at the Home Office, it is still behind its work. We are quite of the opinion that at least a considerable share of the duties which these officials vainly strive to perform might far more satisfactorily, far more economically, far more completely, be accomplished by utilising the large staff of ready-made factory inspectors that now exist in every district of the kingdom in the persons of the local medical officers of health.

SMALL-POX AND VACCINATION IN CALCUTTA.

IN view of the general prevalence of small-pox at Calcutta last year and the small mortality in the town as compared with former epidemic years (the total deaths were 478), it was thought that 1885, according to the habit and history of the disease in the town, would prove to be an epidemic year of great severity. But the mortuary statistics of the first quarter of the year, as given in the report of the officiating health officer, Dr. J. O'Brien, do not tend to support these anticipations. In fact it would appear that 1884 was the year of the epidemic, but of an epidemic aborted and controlled by widespread vaccination. During the year which has just ended, close on 16,000 vaccinations and re-vaccinations were performed in the town, a larger number than in any previous year. Accordingly, small-pox instead of prevailing in epidemic form, as was expected, has subsided considerably. The total number of deaths registered from the disease during the quarter was 74 against 161, the average of the preceding decade. The decline was well marked in each of the three months, and most so in March, the total barely equalling one-third of the decennial average. The total number of vaccinations and re-vaccinations amounted to 6,998 against 6,029, the average of the four previous years. In those years, the first quarter was the season in which by far the largest amount of vaccine work was done; whereas during the past year, as vaccination was pressed on with equal vigour throughout the entire year, without the interruption of a recess, a smaller number of children remained to be protected. Accordingly, in last quarter, the figures assimilate more closely to the averages than in the three preceding quarters in which the out-turn of work was double and treble the average.

TYPHOID FEVER AT YORK.

A VERY complete and excellent report has been presented to the Town Council of York by Mr. S. W. North, the local Health Officer, with reference to a serious outbreak of typhoid fever which occurred in that city during the second half of last year. Of course typhoid fever is never quite absent from York, but its dimensions last year were so abnormal as to call for very special inquiry. The outcome of the investigations made by Mr. North, and also, on behalf of the Local Government Board, by Dr. Hubert Airy, is briefly that the defective character of the drainage was largely responsible for the recent epidemic. The interest of the out-

break is therefore more local than general, for there is nothing very remarkable in the conclusion that, given water-logged sewers connected with imperfectly-trapped drains, an outbreak of typhoid fever will result when a flood drives out of the sewers, by the easiest avenue of escape, the foul air which has been stored in them during a period of dry, hot weather. Altogether there were in 1884 fifty-seven deaths from typhoid fever at York, and 327 recognised cases of that disease. A study of the drainage areas and the levels of the sewers, with the distribution of fever, shows that the largest proportion of cases of fever occurred on the lines of sewers having the lowest levels, and for this reason most subject to the influence of variations in the height of the river, and most liable to have the sewage detained in them by the effects of flood. The constant invasion of the sewers from the outlet by flood water not only causes the sewage to be retained during such floods, but increases the tendency to deposit. These deposits become the receptacles of infected secretions, and a favourable soil for the reproduction of the infective agent, a source from whence it may be carried into streets and houses on higher levels by every influx of flood water which forces sewage and foul gas into the branch drains, and by defective joints in house drains into the interior of dwellings. All these conditions become aggravated when, as is the case in York, the sewers are not ventilated, never flushed, and from which the deposits are never removed, except so far as heavy rains may accomplish their removal, made still worse by the retention and use of old sewers even after new ones have been constructed. The practice of allowing the old sewers and drains to remain without being broken up, and to be frequently used, greatly increases the probability of rendering the subsoil foul and the area on which the city is built unwholesome. No proper cleansing is possible, and accurate knowledge of the position and condition of such sewers is liable to be lost. In the end they become cesspools of the worst description. Imperfect street gullies serve still further to increase the evil. The lesson to be learned from the epidemic is the very obvious one of a complete overhauling and reconstruction of the sewerage arrangements of the city. To do them justice, the Town Council do not appear to be unmindful of this necessity; but it is perhaps lucky for the inhabitants that Sect. 399 of the York Improvement Act of 1884 made it compulsory upon the Council, within two years of the passing of the Act, to prepare a scheme for the efficient drainage of the city for the approval of the Local Government Board.

INSPECTORS OF THE LOCAL GOVERNMENT BOARD.

OUR 'Captious Correspondent' writes: To become an inspector of the Local Government Board would appear to be the passport to fame and fortune. Sir John Lambert, once a poor-law inspector in the Midlands, and afterwards secretary of the Local Government Board, has, for his recent services as chairman of the Boundary Commission, been sworn of Her Majesty's Privy Council. Mr. Walter Sendall, another inspector, is now on his way to the West Indies to take up a colonial governorship. Mr. Courtenay Boyle, after enjoying double emoluments for three years as an inspector of the Local Government Board in England and as the private

secretary to the Lord-Lieutenant in Ireland, is about to finally settle down as an assistant secretary of the Whitehall Board, and has been honoured with a Companionship of the Bath for his dexterity in filling two appointments, and being officially in two places at one and the same time. Mr. Henry Longley, once inspector for the metropolis, is now chief charity commissioner; Mr. George Culley, some time inspector in the North, is one of the commissioners of woods and forests; and Mr. F. W. Beaumont, another inspector, now holds the lucrative office of treasurer of the county of Surrey. The lines of these gentlemen would appear to have fallen in particularly pleasant places.

SANITARY REGULATIONS IN THE PORT OF LONDON.

NEW regulations have just been made by the Port of London Sanitary Authority, with the approval of the Local Government Board, for the removal to hospital of persons brought within the port by any ship or boat who are infected with a 'dangerous infectious disorder,' which includes cholera, diphtheria, erysipelas, measles, scarlatina, small-pox, typhoid or enteric fever, and typhus fever. Every master of a ship arriving in the Port of London, with any person on board, whether a passenger or belonging to the ship's crew, suffering from a dangerous infectious disorder, must stop on arrival off the Custom House at Gravesend, and forthwith send notice of the case to the medical officer of the port sanitary authority stationed at Gravesend. The medical officer of health must as soon as practicable visit the ship, and ascertain whether the person referred to in the notice is suffering from a dangerous infectious disorder. If the patient can properly be removed, and proper hospital accommodation can be provided for him, the master must forthwith cause such person to be removed to such hospital according to the directions of the medical officer of health. If any dangerous infectious disorder should break out on board any ship arriving in the port after she has passed Gravesend, the master must give notice to the medical officer of health of the port, at his office at Greenwich, that there is on board a person suffering from such a disorder, and the same procedure is thereupon to be adopted as in the other case. Infraction of these regulations is punishable by a fine of 5*l*.

THE DRAINAGE OF THE HOUSES OF PARLIAMENT.

THERE has certainly been no undue haste in deciding what is to be done to prevent the recurrence of the offensive effluvia in the Houses of Parliament, on which we recently commented. A Select Committee was appointed last session, but did little more than turn over its duties to the Local Government Board, though it so far influenced the local authority as to secure the closing of the offensive ventilation gratings of the sewer in the roadway to the west of Westminster Hall. According to Mr. Herbert Gladstone, the expediency of the proposals made by Major Tulloch, of the Local Government Board, was doubted by the officers responsible for the drainage system, and a protracted and complete examination, accompanied by numerous and careful experiments on the movement of the air in the main sewer, has confirmed the doubt. Sir Robert Rawlinson, the

Chief Engineering Inspector of the Local Government Board, has, on behalf of his Board, made an additional report, which is said not to bear out the opinions expressed by Major Tulloch, as described by us in our April number. A complete report, containing a detailed account of all the experimental data which have been obtained, will very shortly be completed. Honourable members will do well, for their own comfort and peace of mind, to keep this matter well under the notice of the Office of Works, in view of the advent of seasonably hot weather.

THE VACCINATION OFFICERS' ASSOCIATION.

THE first annual report of this excellent and promising little society has been issued. Its financial exhibit is not on a very stupendous scale, but it at least shows a balance to the credit of the society—a result which secretaries of institutions far more pretentious would be sincerely desirous of emulating. The association was inaugurated on February 16, 1884, and during the year forty-four members and twenty-four honorary members were entered upon its roll. Nine general meetings and six committee meetings were held, and the following subjects brought forward, discussed, and resolutions passed thereon, viz.:—Cases of removal; alteration in death-sheet to show where child was born; alteration of words in certificate forms, B and C; inefficient vaccination; inaccurate registration; house-to-house visitation; opposition to vaccination; debate raised by Dr. Cameron in the House of Commons upon the system of vaccination as adopted in Glasgow, as compared with that practised in the metropolis; the National Health Society's pamphlet; the half-yearly returns of vaccination; resolution of St. James's vestry as to the transfer of public vaccination from the authority of guardians of the poor to that of vestries; the recrudescence of small-pox in the metropolis; certificates of insusceptibility. This very comprehensive list of subjects shows that throughout the year the members have earnestly directed their efforts towards promoting the objects for which the association was formed. Having made so excellent a beginning, the society may fairly claim and expect an increased share of public support.

SMALL-POX IN VIENNA.

WE have more than once in Vaccination Notes contrasted the Austrian and German death-rates from small-pox, and shown that the mortality in Vienna alone far exceeds that of the whole German Empire, and in some years even that of Prague has been nearly as high. We see that the authorities of the Austrian metropolis have at length awoke to the gravity of their position, and are taking vigorous measures for the isolation of small-pox patients in special hospitals, the removal of the healthy members of the families attacked, the exclusion of such for a time from workshops and schools, compulsory vaccination of unvaccinated children in infected houses, and disinfection of houses, bedding, clothes, and vehicles. They have also resolved on urging general vaccination and revaccination, on prohibiting the use of public vehicles for the conveyance of small-pox patients, and providing for that purpose special ambulances. All coffins are to be taken to a central mortuary, or to be made air-tight, and all funereal upholstery and drapery are forbidden. A

steam disinfecting oven is to be set up at the municipal fever hospital, and a transportable one obtained for the disinfection of houses.

VITAL STATISTICS OF BERLIN, MUNICH, AND FRANKFORT FOR 1884.

IN Berlin the birth-rate during the past year was 35·88, exclusive of stillborn. The death-rate, 26·49. The deaths of infants under one year were 33·3 per cent. of the births, and 39·13 of the total deaths. This is a fearful mortality when we consider that in our own large towns the percentage of infant deaths to births (the only useful way of estimating it) ranges from 14 in London to 20 in Leicester. Still this is an improvement on former years, especially as regards infectious diseases, and the occurrence of but two deaths from typhus and none from relapsing fever contrasts very favourably with many towns of central and eastern Europe. Small-pox was more prevalent than of late, having caused 20 deaths in a population of 1½ million. In Munich the death-rate was 30·45, the deaths of infants 39·7 of the total, or 31·12 per cent. in the births. The birth-rate 28·92 per 1,000 inhabitants. No deaths occurred from typhus or small-pox in a population of over 240,000. In Frankfort, with 146,000 inhabitants, the death-rate was only 20·40 per 1,000, the birth-rate 28·25. The deaths of infants were 26·5 per cent. of the total deaths, and 19·1 of the births. There were no deaths from small-pox; indeed, there has not been one for many years.

MEASLES IN THE NORTH.

THE continued excessive death-rate of Newcastle is naturally exciting much uneasiness in that city. There is no doubt that it arises mainly from the serious epidemic of measles which prevails there. It is said that the system of living in tenements, so common in that city amongst the working classes, offers great facilities for the spread of the disease, and presents insurmountable obstacles to necessary isolation. It is debatable whether tenemented property is, after all, blameable so much as suggested, as in Sunderland, where the epidemic has been raging with equal if not greater virulence, tenemented property does not exist to anything like the same extent as in Newcastle. In Hebburn and Jarrow, which are also seriously affected by the epidemic, tenemented property is almost unknown. We are afraid that the chief factor will be found in the gross ignorance and culpable folly of parents, against which the most perfect sanitary arrangements and best medical skill unhappily so often prove powerless. In the week ending June 6 the average death-rate of Newcastle was 31 per 1,000. Measles caused 13 deaths, or an average of 4·4 per 1,000.

UNCERTIFIED DEATHS.

AT a recent meeting of the Glasgow Philosophical Society Dr. John Glaister read a paper on the necessity for legislative reform in Scotland in regard to uncertified deaths. In Scotland there existed a large percentage of 'uncertified deaths.' There existed a clamant necessity for reform in the machinery, as at present established, for the registration of deaths; first, in the Acts themselves, in so far that as the English Act tends to bring about earlier official knowledge of the cause of death, and that by

reason of the shorter period within which a certificate must be produced, and also by reason of the fact that it is enacted that the legal informant of the death should personally convey it to the registrar, the Scotch law should be so amended; and, secondly, that it should not be permitted to inter a body before a certificate of the cause of death be forthcoming, and in the event of no such certificate being produced, that some other official other than the procurator-fiscal should be appointed to inquire into the cause of every death which is not otherwise certified, with full powers to make a thorough inquiry. This, Dr. Glaister thought, could be best effected by appointing the medical officers of health for this duty, since it falls distinctly within the confines of their duties, would be less repugnant to the Scotch mind than the inquest of the coroner, and would meet the requirements of the case as efficiently as the coroner, and very much better than the procurators-fiscal have ever been able to accomplish.

A DESERVED HONOUR.

DR. CHARLES CAMERON, the superintendent officer of health for the City of Dublin, and chief Government analyst, has received the honour of knighthood from the Lord Lieutenant, in recognition of his distinguished services in the promotion of the public health, and his scientific attainments. No mark of Government favour was ever bestowed with more popular approbation, for Sir Charles Cameron is not only held in high esteem by his personal colleagues, but by the general public. To his advice and exertions are largely due the efforts made of late years by the Corporation to improve the sanitary condition of Dublin. The College of Surgeons have recognised his devotion to this branch of medical science by electing him their professor of hygiene and chemistry, and he has been recently elevated by them to the high dignity of their president.

HOSPITALS ASSOCIATION.—We are asked to mention that Mr. J. L. Clifford-Smith has resigned the office of honorary secretary of this association.

A HEAVY RATE.—The Wisbech Town Council and Urban Sanitary Authority made a rate of 4s. 4d. in the pound at their quarterly meeting on Friday, May 15.

'THE FOWLS OF THE AIR.'—A Sunday-school teacher, reading these words to her class, proceeded to ask them—'What are "the fowls of the air?"' After a pause, one little girl solved the problem by replying—'Please, miss, it's the bad smells.'

LEAD POISONING.—The coroner of Newcastle held an inquest on the 9th inst. on the body of Eliza Lucy Arthur, aged 35 years, who died suddenly on the previous day at her lodgings, 116 Conyers Road. The jury expressed their opinion that the death of the deceased had been accelerated by working at a white lead factory.

TYNE PORT SANITARY AUTHORITY.—A meeting of this authority was held in the Town Hall, Newcastle, on June 10, the chairman (Alderman Wilson) presiding. Inspector Taylor reported that in April and May he visited 1,078 British steamers, 608 British sailing vessels, 337 foreign steamers, and 264 foreign sailing vessels. He also made 264 extra visits. Twenty-two cases of sickness had come under his notice, but only one infectious case—that of typhoid fever on a Danish vessel from Hamburg. Fourteen smoke letters have been sent out, and several verbal cautions given. Dr. Armstrong, medical officer of the authority, stated that special precautions were still in force to prevent the introduction of cholera into the Tyne. The Government inspector considered that the port was well looked after.

THE PUBLIC HEALTH

DURING APRIL 1885.

THE mean temperature during the month of May at the Royal Observatory, Greenwich, was 49°·6; it was as much as 3°·0 below the average May temperature in one hundred years, and below that recorded in the corresponding month of any year since 1879. An excess of temperature prevailed on twelve days of the month, while on the other nineteen days it was below the average. The warmest day of the month was the 28th, when the mean was 63°·1, and showed an excess of 6°·6; the coldest day was the 7th, when the mean did not exceed 42°·3, and was 8°·0 below the average. Rain was measured at Greenwich on nineteen days of the month, to the aggregate amount of 2·1 inches, which corresponded with the average May rainfall in sixty-one years, though it exceeded that recorded in the same month of any preceding year since 1879. During the first five months of this year the rainfall at Greenwich has amounted to 9·4 inches, which was more than half an inch above the average for the same period in sixty-one years. The sun was above the horizon during 482·1 hours during May, but only 151·7 hours of bright sunshine were recorded at Greenwich; this amount was considerably below that registered in the corresponding period of any of the five preceding years. The wind was very variable until the last week of the month, when south-westerly winds prevailed.

In the twenty-eight large English towns dealt with by the Registrar-General in his weekly return, which have an estimated population of nearly nine millions of persons, 21,661 births and 14,111 deaths were registered during the four weeks ending the 30th ult. The annual birth-rate, which had steadily declined from 36·4 to 34·6 per 1,000 in the four preceding months, further fell to 31·7 during May (principally owing to the delay in registration during the last week of the month, being Whit-week). In these twenty-eight towns the lowest birth-rates last month were 26·6 in Brighton, 26·6 in Huddersfield, and 27·6 in Halifax; in the other towns the rates ranged upwards to 38·7 in Sunderland, 39·2 in Preston, and 39·8 in Cardiff. The birth-rate in London last month did not exceed 30·6 per 1,000, whereas it averaged 32·7 in the twenty-seven provincial towns.

The annual death-rate in the twenty-eight towns, which had been 21·2, 22·5, and 23·2 per 1,000 in the three previous months, declined to 20·7 during May. This rate was below that recorded in the corresponding period of either of the three preceding years. The lowest rate of mortality last month in these towns was 14·6 per 1,000 in Brighton. The rates in the other towns, ranged in order from the lowest, were as follow:—Bolton, 15·5; Derby, 17·8; Bradford, 17·9; Leicester, 18·0; Bristol, 18·4; Halifax, 19·0; Nottingham, 19·2; London, 19·3; Hull, 19·3; Birmingham, 19·7; Plymouth, 19·9; Leeds, 20·0; Huddersfield, 20·6; Norwich, 20·9; Salford, 21·0; Portsmouth, 21·0; Wolverhampton, 21·2; Sheffield, 21·6; Birkenhead, 21·6; Sunderland, 22·9; Liverpool, 24·5; Oldham, 24·8; Cardiff, 25·3; Blackburn, 27·5; Manchester, 27·5; Preston, 31·6; and the highest rate during the month, 31·7 per 1,000 in Newcastle-upon-Tyne. While the death-rate in London, as above stated, did not exceed 19·3 per 1,000, it averaged 21·8 in the twenty-seven provincial towns. The 14,111 deaths from all causes in the twenty-eight towns during the four weeks of May included 1,942 which were referred to the principal zymotic diseases, of which 680 resulted from measles, 523 from whooping-cough, 175 from small-pox, 157 from diarrhoeal diseases, 152 from 'fever' (principally enteric), 139 from scarlet fever, and 114 from diphtheria. These 1,942 deaths were equal to 13·8 per cent. of the total deaths, and to an annual rate of 2·84 per 1,000. This zymotic death-rate corresponded with the rate in the preceding month, and was below that recorded in the corresponding period of 1884. The zymotic death-rate in London during May was equal to

3.05 per 1,000; in the twenty-seven provincial towns it averaged 2.67 per 1,000, and ranged from 0.5 in Brighton, and 0.7 in Derby and in Bolton, to 4.6 in Birkenhead and in Cardiff, 5.9 in Blackburn, and 7.2 in Newcastle-upon-Tyne.

Measles was the most fatal zymotic disease in the twenty-eight towns during May. The rate of mortality from this disease in these towns, which had increased from 0.42 to 1.10 per 1,000 in the four preceding months, declined during May to 1.00. In London the death-rate from measles was 1.08 per 1,000, while in the twenty-seven provincial towns it averaged 0.92, and showed the highest proportional fatality in Liverpool, Manchester, Birkenhead, and Newcastle-upon-Tyne. The recent epidemic of measles in Sunderland appears to have almost disappeared, only 16 deaths having been referred to this disease during the four weeks of May, whereas the average weekly number during the three preceding months had been no fewer than 18. The death-rate from whooping-cough, which had been 0.65, 0.71, and 0.72 per 1,000 in the three previous months, further rose to 0.77 during May, but was considerably below the high rate (0.96) recorded in the corresponding period of last year. In London the rate of mortality from this disease was equal to 0.71 per 1,000, while it averaged 0.82 in the twenty-seven provincial towns, among which the highest rates were recorded in Birkenhead, Oldham, Plymouth, and Blackburn. The rate of mortality from 'fever' (principally enteric or typhoid) showed a slight increase upon that recorded in the two previous months; in London the fever death-rate last month was 0.20 per 1,000, and was below the average of the twenty-seven provincial towns, among which this disease was somewhat prevalent in Salford, Sunderland, and Norwich. The rate of mortality from diarrhoeal diseases showed a further slight increase upon that returned in recent months, but was below the average of the three preceding years. The death-rate from scarlet fever corresponded with that in the previous month; while the rate of mortality from this disease in London did not exceed 0.15 per 1,000, it averaged 0.25 in the provincial towns, among which the highest rates were recorded in Sunderland and Wolverhampton. The death-rate from diphtheria was equal to 0.17 per 1,000, and showed a slight further increase upon the rates in the two preceding months; this disease was last month more than twice as prevalent in London than in the aggregate of the twenty-seven provincial towns. During the four weeks of May 175 fatal cases of small-pox were recorded in the twenty-eight towns; the fatality of this disease showed a further increase upon that in recent months. Of the 175 deaths, 155 occurred in London (exclusive, however, of 91 deaths of London residents from this disease in the Metropolitan Asylum Hospitals situated outside Registration London), 9 in Manchester, 4 in Sunderland, 3 in Sheffield, 2 in Hull, 1 in Bristol, and 1 in Liverpool. Judged by the returns of the Metropolitan Asylum Hospitals, the prevalence of small-pox in London showed a marked further increase. The number of small-pox patients under treatment in these hospitals, which had been 1,103 and 1,282 at the end of the two preceding months, further rose to 1,389 at the end of May. The average weekly number of new patients admitted to these hospitals, which in the two previous months had been 203 and 273, was 270 during May.

The rate of infant mortality in the twenty-eight towns, measured by the proportion of deaths under one year of age to registered births, was equal to 151 per 1,000 during May, which exceeded that recorded in the corresponding periods of any of the three preceding years. While the rate of infant mortality last month did not exceed 137 per 1,000 in London, it averaged 161 in the twenty-seven provincial towns, among which it ranged from 94 and 98 in Brighton and Birkenhead, to 195 in Oldham, 213 in Newcastle-upon-Tyne, 242 in Blackburn, and 281 in Preston.

The death-rate from diseases of the respiratory organs, judged by the metropolitan returns, was below the average during May. The weekly number of deaths referred to these diseases in London averaged 296, and the annual death-rate was equal to 3.8 per 1,000. In Liverpool the annual rate of mortality from these diseases was last month equal to 4.6 per 1,000.

The causes of 302 of the 14,111 deaths recorded in the twenty-eight towns during the four weeks of May were not certified, either by registered medical practitioners or by coroners. These uncertified deaths were equal to a proportion of 2.1 per cent. of the total deaths, which was lower than that recorded in any recent month. In London the proportion of uncertified deaths did not exceed 1.0 per cent., while it averaged 3.0 per cent. in the twenty-seven provincial towns. All the causes of death were duly certified in Brighton and Derby during the month under notice; in the other towns the proportion of uncertified deaths ranged upwards to 6.1 per cent. in Sheffield, 6.2 in Hull, and 7.1 in Leeds.

Among the population living in the outer ring of suburban districts around London, estimated at rather more than a million persons, the annual death-rate from all causes during May was equal to 16.9 per 1,000, against 16.0, 17.2, and 15.9 in the corresponding months of the three preceding years 1882-83-84. During the four weeks ending the 30th ultimo, 113 fatal cases of small-pox, 64 of measles, 36 of whooping-cough, 16 of diphtheria, 13 of diarrhoea, 9 of scarlet fever, and 6 of 'fever,' were recorded in the outer ring. These 257 deaths were equal to an annual rate of 3.1 per 1,000, which slightly exceeded the rate in the preceding month. The fatality of measles, scarlet fever, and whooping-cough showed an increase, while that of the other diseases declined. Of the 113 deaths from small-pox in the outer ring, 89 occurred in the district of West Ham (including 1 of a London resident registered in the Metropolitan Asylum Hospital at Plaistow), 8 in Edmonton, 4 in Croydon, and 4 in Bromley districts. Of the 64 fatal cases of measles, 24 were returned in Croydon district, and 22 in West Ham. Five deaths from diphtheria were recorded in the sub-district of Tottenham.

NOTIFICATION OF INFECTIOUS DISEASES IN THIRTY-ONE URBAN SANITARY DISTRICTS.

THE table on page 571 contains uniform statistics relating to sickness and mortality in thirty-one of the thirty-nine urban sanitary districts of England and Scotland in which the notification of infectious diseases is compulsory. The population of the thirty-one towns for which we are enabled to publish complete statistics for the month of May is estimated at rather more than three millions of persons. The annual death-rate from all causes during May in these thirty-one towns averaged 20.00 per 1,000 persons estimated to be living therein, against 22.05 and 22.66 in the two preceding months. The rate of mortality in the twenty-eight towns dealt with by the Registrar-General in his weekly return was 20.70 during May, and therefore exceeded by 0.70 the rate in the thirty-one towns in the accompanying table. The death-rates last month were considerably below the average in Burton-upon-Trent, Bolton, Lancaster, Barrow-in-Furness, Accrington, and Edinburgh; while they showed an excess in Oldham, Jarrow, Blackburn, and Newcastle-upon-Tyne. The rate from the eight infectious diseases dealt with in the table averaged 0.50 per 1,000, showing a slight further decline from the rates recorded in recent months. No death from any of these infectious diseases was recorded last month in Hartlepool, Lancaster, Leek, and only one in the ten other towns: they caused the highest rates in Leicester, Barrow-in-Furness, Salford, and Burton-on-Trent. Small-pox caused one death in Halifax; scarlet fever was proportionally most fatal in Barrow-in-Furness, Salford, and

Table Showing Sickness and Mortality in Large Towns of England and Scotland During the Month of May 1885.

Towns.	Estimated Population Middle of 1885.	Small-pox.		Scarlet Fever.		Diphtheria.		Typhus Fever.		Enteric Fever.		Cholera.		Relapsing Fever.		Puerperal Fever.		Totals of Preceding Columns.	Annual Rate per 1,000 Persons Living.		Deaths from other Zymotic Diseases.				Total Mortality from all Causes per 1,000 Persons Living.
		Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.	Reported Cases.	Deaths.		Reported Cases.	Deaths.	Ill-defined Fever.	Malaria.	Whooping-Cough.	Dysentery.	
Aberdeen	113,212	—	—	19	—	5	1	—	—	9	—	—	—	—	—	—	—	33	1	3.43	0.10	—	—	2	18.00
Accrington	35,000	—	—	1	—	1	—	—	—	4	—	—	—	—	—	—	—	6	1	2.02	0.34	—	—	2	16.16
Barrow-in-Furness ..	50,000	—	—	20	3	4	2	—	—	9	—	—	—	—	—	—	—	33	5	7.77	1.18	—	—	3	16.01
Birkenhead	93,000	3	—	14	—	2	—	—	—	—	—	—	—	—	—	—	—	19	3	2.41	0.38	—	—	13	22.30
Blackburn	110,500	1	—	9	—	—	—	—	—	7	—	—	—	—	—	—	—	17	2	1.66	0.19	—	—	6	28.50
Blackpool	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bolton	110,085	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bradford	214,411	—	—	29	1	3	2	—	—	11	4	—	—	—	—	—	—	43	7	2.61	0.43	—	—	3	14.45
Burnley	67,000	—	—	12	—	—	—	—	—	5	—	—	—	—	—	—	—	19	1	3.70	0.20	1	—	2	17.87
Burton-on-Trent ..	45,597	—	—	27	11	6	3	—	—	2	—	—	—	—	—	—	—	35	14	9.66	3.63	—	—	3	17.51
Bury	55,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	1	1.14	0.19	—	—	—	11.65
Chadderton	17,500	—	—	3	—	1	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17.25
Derby	87,608	—	—	9	—	—	—	—	—	—	—	—	—	—	—	—	—	9	—	1.67	0.12	—	—	—	17.62
Dundee	152,818	—	—	14	—	3	1	—	—	6	—	—	—	—	—	—	—	15	2	1.93	0.15	—	—	2	16.88
Edinburgh	250,615	—	—	87	—	5	1	—	—	55	7	—	—	—	—	—	—	153	8	7.05	0.38	—	—	5	16.17
Greenock	73,695	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	10	2	1.77	0.35	—	—	2	20.52
Halifax	77,000	2	1	6	2	1	—	—	—	5	—	—	—	—	—	—	—	9	3	1.53	0.51	—	—	3	18.79
Hartlepool	18,000	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	2	—	1.31	0.00	—	—	—	18.98
Heywood	25,000	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	4	—	1.89	0.47	—	—	—	20.26
Huddersfield	87,337	—	—	9	—	—	—	—	—	4	—	—	—	—	—	—	—	13	1	1.94	0.15	—	—	4	20.60
Jarrow	39,000	—	—	5	1	—	—	—	—	—	—	—	—	—	—	—	—	6	1	2.61	0.43	—	—	—	26.51
Lancaster	20,724	—	—	7	—	—	—	—	—	1	—	—	—	—	—	—	—	8	—	4.83	0.00	—	—	—	15.09
Leek	13,462	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	—	—	—	18.44
Leicester	136,147	—	—	149	3	5	2	—	—	17	5	—	—	—	—	—	—	172	10	16.47	0.96	—	—	3	17.81
Llandudno	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Liverpool	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Macclesfield	37,641	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Manchester	341,598	—	—	79	13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Newcastle-on-Tyne ..	153,209	—	—	57	4	—	—	—	—	18	2	—	—	—	—	—	—	152	22	4.95	0.67	—	—	7	29.69
Norwich	93,215	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	31.70
Nottingham	211,444	1	—	—	3	—	—	—	—	45	3	—	—	—	—	—	—	77	8	3.80	0.39	—	—	5	20.90
Oldham	126,320	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18.84
Portsmouth	134,659	2	—	7	—	5	4	—	—	2	—	—	—	—	—	—	—	14	4	1.44	0.41	—	—	6	24.75
Preston	100,406	2	—	16	—	20	4	—	—	47	2	—	—	—	—	—	—	85	6	8.77	0.58	—	—	3	21.70
Reading	46,970	—	—	52	4	4	—	—	—	11	2	—	—	—	—	—	—	41	10	4.81	1.17	—	—	3	29.80
Rotherham	35,650	—	—	22	1	—	—	—	—	—	—	—	—	—	—	—	—	53	1	11.77	0.22	—	—	—	19.98
Salford	204,060	—	—	—	—	—	—	—	—	3	1	—	—	—	—	—	—	26	1	9.51	0.37	—	—	—	17.55
Salisbury	20,450	4	—	41	9	6	1	—	—	14	7	—	—	—	—	—	—	70	20	4.47	1.28	—	—	5	21.62
Stafford	26,931	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Stalybridge	26,931	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Warrington	45,412	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	1	3.39	0.48	—	—	1	19.84

Burton-upon-Trent; enteric fever in Edinburgh, Leicester, and Salford; diphtheria in Burton-upon-Trent, Oldham, and Portsmouth; measles in Birkenhead and Jarrow; and whooping-cough in Barrow-in-Furness, Blackburn, and Oldham. Two deaths from typhus were recorded in Salford, and a fatal case of puerperal fever in Bolton, in Nottingham, and in Salford. With reference to the notified cases of infectious disease in the thirty-one towns, it appears that the proportion of the population reported to be suffering from one or other of the eight diseases specified in the table was 4·46 per 1,000, which was slightly below the proportion in the preceding month. No case of any of these diseases was notified in Leek during the month under notice; and, whereas the rate did not exceed 1·07 per 1,000 in Derby, 1·14 in Bury, and 1·31 in Hartlepool, it ranged upwards in the other towns to 7·77 in Barrow-in-Furness, 8·27 in Portsmouth, 9·06 in Burton-upon-Trent, 9·51 in Rotherham, 11·77 in Reading, and 16·47 in Leicester. The excessive rates in these last-mentioned towns were due to the prevalence of scarlet fever. Four cases of small-pox were notified during the month in Salford, and 3 in Birkenhead; scarlet fever showed the greatest proportional prevalence in Barrow-in-Furness, Burton-upon-Trent, Leicester, Reading, and Rotherham; diphtheria in Burton-upon-Trent and Portsmouth; and enteric fever in Edinburgh, Nottingham, and Portsmouth.

SPECIAL REPORTS.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

A MEETING of the Society was held at 1 Adam Street, Adelphi, on Friday, May 15, T. Orme Dudfield, M.D., President, in the chair.

The President referred to the recent legal decisions with regard to the burning of bricks in proximity to inhabited dwelling-houses (see p. 589), and it was resolved that a letter should be addressed to the Metropolitan Board of Works suggesting that this trade should now be brought under regulations when carried on near dwelling-houses.

THE ETIOLOGY OF GOITRE.

Dr. Thursfield read a paper on the 'Etiology of Goitre in England.' The author stated that his attention was first directly drawn to the matter some three years ago, in consequence of being requested by a sanitary authority to inquire into an epidemic prevalence of goitre amongst the children in some schools. The undoubted epidemic nature of the disease was so diametrically opposed to the etiological views almost universally given in the text-books on medicine that he was led to extend his inquiries. After referring to the official definition of goitre of the College of Physicians as 'enlargement of the thyroid gland, endemic in certain mountainous districts, but not limited to them,' he stated that the primary causes of goitre were climatic, physiological, including sex, heredity, &c., industrial, dietetic, neurotic, and strumous diathesis. Climatic influence is the chief factor, and the endemic prevalence of goitre is not found at much less altitude than is indicated by a fall in the column of mercury equal to about three-quarters of an inch; this diminished atmospheric pressure, together with the climbing of hills, leading to sudden alterations in the circulation. Of the thyroid gland little is known, save its anatomical structure, and it has this peculiarity, that of all the glands of the body which we can see or feel, it is most prone to and most capable of alteration in volume, and it is to this peculiarity that goitre is due. That goitre is frequently entitled to be called an industrial disease he had no doubt. Carrying weights on the head or otherwise, so as to interfere with the cerebral circulation is a most potent contributing cause. With regard to dietetic influence, he was disposed to think that in some of the localities water

containing iron was certainly a factor in the production of the disease. He believed that endemic goitre is disappearing in England, owing chiefly to the disuse of the practice of carrying weights on the head.

DISCUSSION.

The President, in moving a vote of thanks to Dr. Thursfield for his very interesting paper, observed that, in all probability, many of those present would be in the same position with himself in having only a theoretical acquaintance with the subject. He appealed to the country members present to favour the Society with their experiences, whether confirmatory or otherwise, of the views of Dr. Thursfield, whose paper would form an interesting item in the next volume of the 'Transactions.'

Dr. T. Moore said that his experience in Worcestershire was that goitre was very prevalent there; he came to the same conclusions as Dr. Thursfield, that the majority of the cases were attributable to the women carrying weights on their heads, and he concluded that the weight must interfere with the circulation. Other medical men to whom he mentioned the cases came to the same conclusion. There was not a great amount of saline matter in the water they drank and there was a little iron, but he had no opinion on this point. In India, where both sexes carried weights upon their heads, the disease was very prevalent.

Dr. Seaton asked if the reader of the paper had had any experience in Derbyshire, because he thought that in the hilly districts of that county the disease would be noticed. He had frequently observed the people carrying weights in the Swiss valleys, where goitre was most marked. He had no recollection of seeing in the text-books the carrying of weights as a probable cause of goitre, nor had he, when at St. Thomas's Hospital, heard this point referred to, but at the same time it occurred to him that the cause assigned by Dr. Thursfield was a very possible and probable one.

Mr. Murphy asked whether Dr. Thursfield could inform the society whether goitre occurred as frequently amongst men as women in India, and observed that both sexes in that country carry weights on their heads.

Dr. Thursfield, in reply, said he was surprised that his paper had been received with so little opposition. Dr. Aitken, whom he knew well, used to refer to goitre as an Indian disease, but without any connection with carrying weights on the head. Goitre in India was as common in the male as in the female. He was gratified to find that carrying weights on the head as a contributory cause had been noticed by someone else, but he believed that goitre arose from no single cause.

DIARRHŒA AT SETTLE.

Mr. F. E. Atkinson read a paper on an epidemic of diarrhoea which prevailed in the rural district of Settle during October and November of last year. From Oct. 5 to Nov. 5, 218 cases occurred in 120 houses, 188 in Settle and 30 in Giggleswick; up to Oct. 18 two or three fresh cases occurred every day, but after that they increased, until on Oct. 23 as many as 27 fresh persons were attacked; after this date the epidemic rapidly declined, and on the 29th ceased. The chief symptoms were: rigor, headache, pains in the abdomen, vomiting and diarrhoea, the stools often containing mucus or blood; delirium and hicough occurred in the worst cases. The disease lasted from a few hours to a fortnight, and there was a tendency to relapse. The large majority of persons who were attacked were over five years of age. It was possible to eliminate the sewerage system, and all articles of food but water. The chief water supply is obtained from springs from which the water is conveyed to a reservoir, but may be supplied to the town without entering the reservoir, twenty-nine houses being always thus supplied, it has also a supplemental supply only to be used in case of emergency; the latter commences in high land at the corner of a field.

where it receives the overflow from two cattle-troughs which are supplied from a spring higher up. On Oct. 13 the water in the reservoir was at its lowest point, and there was a certain amount of vegetable growth at the bottom, and on Oct. 14 the supplemental supply was received. The troughs referred to were surrounded with manure, which would percolate into the stream. On Oct. 24 the water was supplied direct, and not through the reservoir, which was found full of slimy green vegetable matter. It must be noted that the water of the reservoir was polluted throughout; that on Oct. 14 it received an additional polluted supply; and that on Oct. 24 the reservoir was no longer used. These dates correspond with the increase and termination of the outbreak, allowing four days as incubation period. Corroborative evidence that the water supply was responsible for the outbreak is to be found in the facts that of those attacked all but eleven persons had been known to receive their water from the reservoir, and the latter might have drunk the water at other houses; again, the twenty-nine houses supplied directly from the springs escaped, together with the 180 inhabitants of the Giggleswick Grammar School, and the residents in a number of other houses who had private supplies.

DISCUSSION.

The President, in moving a vote of thanks to Mr. Atkinson, said he thought he had proved his case, but he was surprised to hear it said that no epidemic of diarrhoea had previously been traced to a polluted water supply. Specific pollution of water often originated epidemics of enteric fever. This had been the case recently at Kidderminster, where pollution of water by sewage simply had previously given rise to febrile attacks of a non-specific character. In London there was, so far as he knew, no cause to attribute epidemic or endemic disease to the use of water except in the well-known instances of cholera. Other disease in single households had been occasioned by neglect of cleanliness in regard to the cistern, and he thought it would not be difficult to find recorded cases of diarrhoeal disease traced to a polluted water supply.

Dr. Thursfield knew of cases of local epidemics proceeding from water, but he had some difficulty in deciding what the disease really was. He was, however, fortunate in making a *post mortem* in one case when he found symptoms of typhoid fever; several outbreaks of diarrhoea had come under his experience in which well-marked cases of typhoid occurred. He did not think any reliance was to be placed on analysis, and a great deal of harm was done by analysts in reporting water to be pure which was really unwholesome.

Mr. Cassal said that analysts themselves were responsible for the fact that so little value was attached to their reports; for instance, Mr. Allen's report on the water at Settle stated that the loss in the solid constituents on ignition was 2.24 grains per gallon, but no mention was made of changes undergone during ignition. Again, it was said that the free ammonia was 0.2, and the albuminoid 0.1 per million, and that these results 'corresponded uniformly with those characteristic of a pure water.' Such a water was highly suspicious and ought to have been submitted to microscopic and cultivation tests. Mr. Cassal, in conclusion, expressed a strong opinion that water analysis was of the greatest value when due regard was had for the method of collection and analysis, and the proper interpretation of results.

Dr. Seaton thought that no one ought to give a positive opinion as to the purity of a water supply unless he had a practical acquaintance with the district. He had known many cases of disease caused by the action of one public analyst in reporting an impossibility, viz., what the condition of the water was a week before his examination. The speaker concluded by referring to Mr. Wanklyn's report on the water supply to the Leek Workhouse which passed through a peaty neighbourhood and gave some people diarrhoea whenever they first drank it.

Mr. Atkinson briefly replied that the symptoms of

typhoid fever appeared to him to be distinct from those of dysenteric diarrhoea. The symptoms exhibited were characteristic of the latter affection, and the fact that the outbreak was traced to the water supply pointed to a specific contamination of the water. If he had been at home at the time he would have taken other samples of water for cultivation, and would have acquainted the analyst with the surroundings. He believed that vegetable organic matter in water occasionally produced diarrhoea.

THE ANTWERP EXHIBITION.

(FROM OUR OWN CORRESPONDENT.)

REVISITING this Exhibition a month after it had been opened, I found it, both internally and externally, far from complete. The façade was still without features, except such contortions as great patches of boarding, stucco, or stone-coloured canvas on brick and iron foundations and walls could give. No doubt, when all the stuccoing, patching, and plastering is done there will be a pretty presentable view of that much mingling of many styles in which Belgian architects indulge. With more iron and glass much better could have been done, and done at once; the great advantage about the style of exhibition building which Joseph Paxton invented being that the ornamental and useful were cast pretty simultaneously and much in the same mould, and put up together, so that as soon as the building would be utilised it lacked little but paint for full completion. The Belgians have, it is true, put a good deal of iron into their Antwerp Exhibition building, but they are spending, and for weeks will have to spend, much time and much money in hiding it. This is very manifest in an immense triumphal arch which is being erected in front of the principal entrance. This arch is surmounted with a great open globe, to represent the whole world, the industries of which are so largely represented within the main building. The framework is of iron, the globe included. All but the globe, however, is being covered in. Rather clumsy imitation rockery is being grouped about the base of each pillar or buttress of the arch, to form cascades and waterfalls, the upper of its two great limbs and the arch itself being covered with planks, which are to be wrapped in stucco clothing of Greek, Roman, Byzantine, and Renaissance art, with a little Egyptian thrown in, such as make such a strange appearance of the Palais de Justice at Brussels. The great globe will be gilt and coloured, and flaunting flags will make it visible for miles on the great broad river which connects Antwerp with the sea, and for miles on the great flat land round about.

But the cascades and the waterfalls will be a great treat to the inhabitants of Antwerp, who never knew a fountain until this Exhibition came. Before the arch a great fountain plays, smaller ones add their picturesque sprays, and when the cascades come into play, the display of water-work will be a local wonder indeed. The astonishment of uninitiated visitors is great at learning on entering the main building that all this water is put in motion by two little Pulsometers, and that all is arranged in so simple a manner that a little water and a little steam make all this display at a very small cost. Ten years ago few persons knew what was meant by the word Pulsometer, and now it is fast becoming a household word, and contributing largely to health and wealth as well as adornment. The idea of the Pulsometer is scarcely novel, for since the first application of steam as a motive power, there were ever attempts to solve the problem how best, by the reciprocal expansion and condensation of steam, to raise water; but the comparatively recent Aquameter of the United States may be regarded as the most successful effort, until Messrs. M. Neuhaus and J. C. Hodgkin brought out the Pulsometer in London. That firm became the Pulsometer Engineering Company, Limited. In 1880 Mr. Neuhaus went to Berlin and opened Pulsometer works there, and the pulsometers at work and on view at Antwerp are furnished by

him. They form a very interesting exhibit, and manifest the principal advantage of the system—that of maximum strength and duration of force with a minimum consumption of steam, and the power of easily raising muddy water and thick liquids to a great height. The illustrations of the advantages of the system in mine, dock, and excavation drainage are plain and satisfactory.

To the attractions of the fountains are fast being added that of flowers, and the most famous florists of Belgium are doing their best to make what not long ago was a sandy desert smile with floral beauty.

Unlike most Continental exhibitions, there are here few separate and particular exhibits or exhibition buildings in the open grounds, but there are plenty of handsome erections for providing for the hunger and thirst of the visitors of all nations. What is most surprising, too, is that provisions are to be had of the best quality at the lowest of prices. There is less provision here, however, than at any Continental exhibition I have visited for the sale of non-alcoholic fluids. It is clear from what is to be seen, as well within as without the grounds, that the good folks of Antwerp prefer beer and wine to coffee, so much so that at more than one café I found coffee was not to be had. The numerous intimations in refreshment-house windows that whisky, brandy, and stout are to be had within, imply that most of the examples of the genus *homo* seen in Antwerp from England are not of a teetotal character.

Not content, however, with providing that refreshments should be cheap and good within the grounds of the Exhibition, its managers appointed a Lodgings Committee, which soon had a list of something like 1,500 'lodgings to let,' at all prices, from 15 francs to 1 franc 50 centimes a day. Every place was visited before being put upon the list, and was classified according to accommodation and comfort. The Lodging Office is plainly to be seen at the railway station by the passenger as he alights from his train.

To supplement this provision for all sorts and conditions of visitors, the committee went a step further, and obtaining from the Municipality the use of the old Athenée turned it into a People's Hotel, where 500 beds are provided at one franc a night, light and attendance included! To provide for the health of the lodgers two physicians are attached to this establishment, and furnish a daily report as to its sanitary condition. The reaction of these arrangements upon the hotel keepers is one of the most salutary character. They early leagued together to make hotel rates as high as they were during the exhibition at Amsterdam two years ago, but soon found that if they persevered in the face of the Exhibition Committee's lodging movement they would soon have little or nothing to do.

With the magnificent boats of the Great Eastern Company to carry him across the sea in comfort for a very low price, and with this assurance that he can lodge and live in Antwerp more cheaply than in London, any one may go and study the manifold curiosities of that old city as well as those of the world's art and industry to be found in its great exhibition, for a trifle.

It is a great Exhibition, too; one admirable in its extent, arrangement, and contents, well worth a visit. What may be called the great nave leading from the main entrance to the machine hall in the rear is cut by the main gallery which runs the whole length of the building, and though here and there there are yet gaps of uncompleted exhibits, one has but to stand at the junction of the four roads, and whichever way one looks there is a glorious display of luxury, wealth, taste, utility, and all the wondrous products of the arts of peace making plenty. Here within view of the eye thus centrally placed there has been keen competition between Frenchmen and Belgians as to who should exhibit the finest products with the most tasteful and taking display. No one appears to have spared expense, and all have brought to the arrangement of their goods that wealth of taste and talent for

exposition only to be found on the Continent. It is wonderful what that taste and talent can do. The Belgians had plenty of ill-looking coal, all the rough accessories of the coal pit, rude iron and the material and apparatus of iron works to show, and have disposed them in such form and with such grace, that though they elbow exhibits of luxurious art in furniture, upholstery, porcelain, and palatial adornment, there is nothing in them incongruous or out of place, or offending the eye, even though it wander into the neighbouring parts, where Italy in general and Venice in particular are showing their wealth of luxury and of taste in all the wondrous products of that sunny land of art.

It struck me as I surveyed the interesting scene that this fact presented a lesson for health and life, teaching how things were not so much in themselves repugnant, but as they were disposed by the disposition of those who used them. But then the Exhibition shows what Bishop Hall found years ago in every good eye—that it can only see in the direction in which it is turned; and I am free to confess that the continental eye of taste that has made up the charming *coup d'œil* presented by the Antwerp Exhibition, does not seem to have been very much turned in a sanitary direction, and that, judging by the comparative paucity of health exhibits, and the multiplicity of others, continental life is more intent upon external show than internal conservation.

Still I was felicitating myself in the great gallery, admirably proportioned and set apart for the display of machinery and heavy iron products, on the absence of Krupp and all material of war, when my way was barred by the struggles of a little army of labourers to haul in a monster gun sent by the French. This cannon comes from the well-known works of Cail of Paris. It is in steel and of the calibre of 34 centimetres, is 11 mètres 20 in length, and weighs 37½ tons. Its diameter at the breech is 1'04, and at the powder chamber 245 millimètres. The projectile to be used varies from 400 to 600 kilogrammes, according to the character of its internal conformation, and will contain as much as 40 kilogrammes of compressed gunpowder; while the charge to be employed varies between 180 and 200 kilogrammes. The initial velocity of the shot is 650 metres; and the range from 17 to 18 kilomètres, or the distance by one route of Versailles from Paris. To give to this cannon of 34 mètres a resistance capable of supporting the reaction of a charge of 180 kilogrammes, a peculiar mode of hooping is adopted, which its inventor, Colonel de Bange, distinguishes as biconical. The gun is, as already stated, of steel, and four rows of hoops of the same metal by virtue of their biconical form clamp one into the other, thus giving it a strength and range which it is said no German gun of the same calibre, produced at a much greater cost, can claim. This gun, and the allusion of its inventor and maker to German cannon, constitute the only exhibit that disturbs the evidence everywhere present at the Antwerp Exhibition of peace, industry and true progress in continental nations. The evidence of the war spirit is in all other respects singularly absent, and it is satisfactory to know that not only is there no Krupp but no other German gun on the ground to reply to the vaunt of this Paris cannon; and that the French war authorities themselves pooh-pooh the pretensions of Messrs. Bange and Cail and their monster cannon.

SANITARY MATTERS IN FRANCE.

(FROM OUR OWN CORRESPONDENT.)

M. NOCARD, professor at the Veterinary School of Alfort, has recently discovered that poultry can contract tuberculosis from human beings. A farmer at Charenton had in his employ a farm servant suffering from phthisis. In order to find him work that would not try his strength, this man had the care of the poultry. He fed the

birds, gave them fresh water, &c. He coughed constantly, and expelled a considerable quantity of expectoration, which, it was observed, was greedily swallowed by the fowls. Six or seven weeks after the phthisical servant had care of the poultry yard, two of its denizens died. Mortality among them increased. The owner sent a fowl to the Veterinary School at Alfort, where it was ascertained that the lungs and liver were full of tubercles, about the size of a pea, and of a greyish yellow colour. In a microscopical preparation there were a considerable number of bacilli. All the fowls were killed, and the poultry yard was disinfected. A less honest farmer would have sent the fowls to market, a probability that doubtless has been and will be realised. As it is supposed that the milk of cows can communicate tuberculosis, the question arises whether tuberculous fowls are not dangerous as articles of food.

A general report of the Municipal Paris Laboratory has just appeared. This laboratory is the outcome of a report made by M. Dumas in 1876, when he urged the Prefecture of the Police to establish a test office, where, by paying a small sum, every purchaser could ascertain that wine is not artificially coloured. The scheme became greatly enlarged, and the laboratory now analyses and tests all articles of food, wines, beer, &c. It is composed of four laboratories, two camera obscura offices, a room for instruments and apparatus, among which are a gas-motor, an electrical machine, a turbine, a ventilator, a laboratory for analysing gas, spectrum analyses, organic analyses and dialyses and distillation, and a room especially arranged for microscopic photography, &c. Qualitative analyses are gratis, quantitative analyses are paid for according to a fixed tariff. Besides general business, the laboratory makes analyses for the Prefecture of the Seine, for the Paris Octroi, for hospitals and prisons, colleges, universities, and the army.

There are twenty experts attached to the laboratory, who perform the duties of inspectors in the markets and among the Parisian tradesmen. They are armed with considerable power, and can destroy adulterated goods on their own responsibility immediately adulteration is demonstrated. If the goods of a tradesman are suspected to be adulterated, the inspectors have the right to seize specimens. Since the laboratory has been founded, an important number of analyses have been made of articles of food, wine, beer, cider, milk, butter, coffee, chocolate; also drugs and different kinds of chemical products. The quantity of lead used in tinning and in soldering the cases containing preserved food has been ascertained, also the proportion of salicylic acid added to articles of food. Sewage has been analysed, also the contents of the *tinettes* (the receptacles into which excrement from water-closets is received), the air of the sleeping rooms at Alfort, cesspool-gases, soil from cemeteries, Seine water, and samples of water used for drinking purposes sent by different communities. Coloured toys, syrups, articles of food coloured by means of copper salts, have been tested to ascertain the presence of nitrates; meat examined for trichinæ. The milk taken from the bottles used in the Paris *crèches* has also been examined, and the influence of different kinds of food on cows' milk has been tested. The influence exercised by the Municipal Laboratory has diminished the dilution of wine by water.

The pupils who attend the sanitary lectures at the Paris Faculty of Medicine visit every Thursday, under the direction of Dr. Landouzy, such public establishments as may be useful to their studies on sanitation. They have visited the laboratory at the Parc Montsouris, where MM. Marie-Davy and Miquel showed them the apparatus and instruments used for meteorological observations. The Cité barracks and the Municipal laboratory will be visited by Dr. Landouzy's pupils. At the Laboratory they will observe how analyses of water and milk are made.

The etiology and prophylaxis of scrofula in infants constitute the subjects of the prize essay of the Commission d'Hygiène de l'Enfance. M. Marjolin, in his report to

the Académie de Médecine on the essays sent in, regretted that the authors had not furnished any personal observations, but had principally gathered together facts for the most part well known. M. Marjolin in his résumé of these essays stated the following conclusions. Scrofula is most often hereditary. When directly inherited it is most dangerous. Frequently scrofula is induced by scanty or improper food, long and painful teething, faulty sanitation, unhealthy dwellings, want of cleanliness, and fevers. The treatment is indicated by the nature of its etiology, healthy houses, pure air, cleanly habits, and a sufficiency of suitable food.

The Académie de Médecine has awarded the prize for essays on infant sanitation to nine competitors. The sum at their disposal is 2,000 francs (80*l.*). This is divided in sums of 1,000 francs (40*l.*) to Dr. Séguinot de Revin, 500 francs (20*l.*) to Dr. Rousse; 200 francs (8*l.*) to Dr. Caradec; 200 francs to Dr. Adrien. Medals were given to other candidates. The subject of the essay was 'Faire connaître par des observations précises le rôle que peut jouer dans la pathologie infantile le travail de la première dentition'—'Proof, by exact study, of the influence exercised by the first dentition on infantile pathology.'

Dr. A. J. Martin has been awarded the Auguste Monbigne prize of 4,000 francs (160*l.*) for his essay on Foreign Civil Sanitary Administration ('l'Administration sanitaire civil à l'étranger').

Dr. Benoist de Grandière has just published a small book on hygiene, entitled 'Notions d'Hygiène.' This volume is as useful and as modest as its title indicates. It is specially addressed to schoolmasters and pupils, most of whom will do well to read it. It has already reached a fourth edition.

M. Gaillet and M. Huet have been awarded a gold medal for the apparatus they have invented for purifying water used in factory boilers. The water is first mixed with lime-water in order to change the carbonate of lime, which, under the influence of carbonic acid, is dissolved into an insoluble carbonate. This carbonate is precipitated into a long and narrow apparatus, so constructed to save space. In the interior of this apparatus there are a series of diaphragms, inclined at an angle of 45°; the water rises slowly and gradually deposits the precipitate, which accumulates on the diaphragms and slides down to the lower angular part of the compartments, whence it is easily withdrawn by opening a tap arranged expressly. This apparatus is much admired for its ingenuity, and it is believed that it will be of great use in factories.

Dr. Proust is appointed to replace Dr. Bouchardat in the Chair of Hygiene at the Paris Faculty of Medicine.

An article entitled 'Experiments upon the Vitality of the Choleraic Comma-Bacillus,' by MM. W. Nicati and W. Rietsch (of Marseilles) forms the principal contribution to the *Revue d'Hygiène* for May. The authors have already answered affirmatively upon the question of the choleraic nature of Koch's comma-bacillus. The article in question contains a table showing the comparative resistance of the bacilli to various disinfectants.

The agents were employed of varying strengths, and in each case the solutions were examined in three stages, after five, ten, and fifteen minutes' exposure respectively.

The writers examine the protective influence attributed by M. Koch to the stomach, but they conclude that the effects obtained are to be attributed simply to the action of the acid juices. The gastric juices being always rich in hydrochloric acid, ought to kill almost instantly the bacilli contained in the food which they envelop. If this is admitted, we shall find nothing surprising in the undoubted fact that those adventurous experimentalists who have swallowed solid choleraic matter (in pills, for example) should not have been attacked by the disease.

The authors consider that if the same matter were taken in water, and on an empty stomach, the result would be very different; their experience leading them to the conclusion that water is the principal agent in the propagation of this much-dreaded epidemic.

A report of a meeting of the Société de Médecine Publique informs us that M. le Dr. P. Rodet presented to the society a translation of 'A Code of Rules for the Prevention of Infectious and Contagious Diseases,' lately published by the London Society of Medical Officers of Schools Association. The reading of this paper provoked a considerable amount of adverse criticism, to which we need not refer in detail, as the discussion is adjourned for two months, at the expiration of which period it will probably be resumed with considerable liveliness.

It will no doubt be found that some confusion has been caused by the doctor's inaccurate translation. He has obviously created a good deal of obscurity by confusing the three words, impétigo (impetigo), teigne (scurf), and herpes tonsurans (ringworm).

The attention of anti-vaccinators is directed to the following figures. The town of Bordeaux opened a gratuitous service of vaccination on Nov. 22, 1881. The effect of this in reducing the number of deaths from small-pox was startling in the extreme.

1876 to 1878	585 deaths from small-pox.
1879 to 1881	545 " " "
1882 to 1884	110 " " "

THE NEW CITY HOSPITAL, ANTWERP.

By U. G. BLACK, F.R.C.S.E.

THE New City Hospital, with circular wards, at Antwerp, was inaugurated with much civic ceremony in October last. It is situated in the Borgerhout quarter, in the north-east district of the new city, outside the new Boulevards, and near the end of the Rue des Images. The site is an open one, with grounds and streets, or roads, all round it, so that there is an abundance of free ventilation. The ground on which the hospital is built is an oblong square, with length north and south, about 223 mètres or 731 feet, and breadth east and west, about 192 mètres or 929 feet, with an estimated total contents of 3.89 hectares, or about 10.50 English acres.

The south side is formed by the Rue des Images, the west side by the Rue de Lazareth, the north side by the Rue Boerhaave, and the east side by the Rue van Helmont.

The hospital is placed in the meridional centre of the grounds, with administrative offices abutting on the Rue des Images and grand entrance, and is estimated at about 190 mètres long or 623 feet, and about 150 mètres broad, or 492 feet outside the towers. It resembles in appearance one of the old Welsh castles of the Edwardian era, as Chepstow or Conway, with their cylindrical towers, curtain walls between each, and square barbicans for the grand entrance. The walls are built of red brick, with yellow sandstone facings and mouldings, while the conical roofs of the towers and the pent roofs of the other buildings are all slated. The grounds around are fenced in from the streets by high iron railings, resting on elevated brickwork with yellow coping stones, and with ornamental brick pillars interposed here and there, and the space inside is kept grassed, and laid out with gravel walks.

On approaching the building the first thing arresting the attention are the towers, and the square block of offices at the grand entrance, and they are disposed outside the wall or enceinte of the hospital, three on each side, and two at the north end. Each tower is of two storeys, with attic and basement besides. The offices are of three storeys, and the connecting corridors of two storeys all round, so that communication is secured continuously everywhere on the same levels. On entering the arch of the carriage-way into the first court, the chapel is to be seen in the centre, facing the gate, with corridors of two storeys connecting it with the corresponding towers at the sides. Further on, in the next court, are situated the kitchen, pharmacy, and store rooms of three storeys, in a central block, connected, as before, by cross-corridors to the corresponding towers on the outside. Still further back lies the official and medical and sister residentiary of three storeys, con-

nected, as before, with corresponding towers on the outside walls by two-storey corridors. Lastly, at the north end of the last court lie the hydropathic or bath establishments, connected right and left with the last two towers by lateral internal angled corridors. In the open space at the north side of the hospital grounds is a square block of buildings, with tall chimney, for the laundry or blanchisserie, containing steam boilers and all the requisite machinery, with a back gate leading into the adjoining street.

The construction of each tower appears to be similar, and therefore a description of one may suffice for all. As already stated, each tower is circular, opening by passages into two corresponding corridors inside the court. Each storey or ward holds twenty beds and fittings, which are disposed radially round the circumference of the room, and with a window between every bed. In the centre of each ward is a round glass-house or conning tower, for the use of the doctors and nurses on duty, duly fitted up with tables, chairs, cupboards, shelves, and telephones.

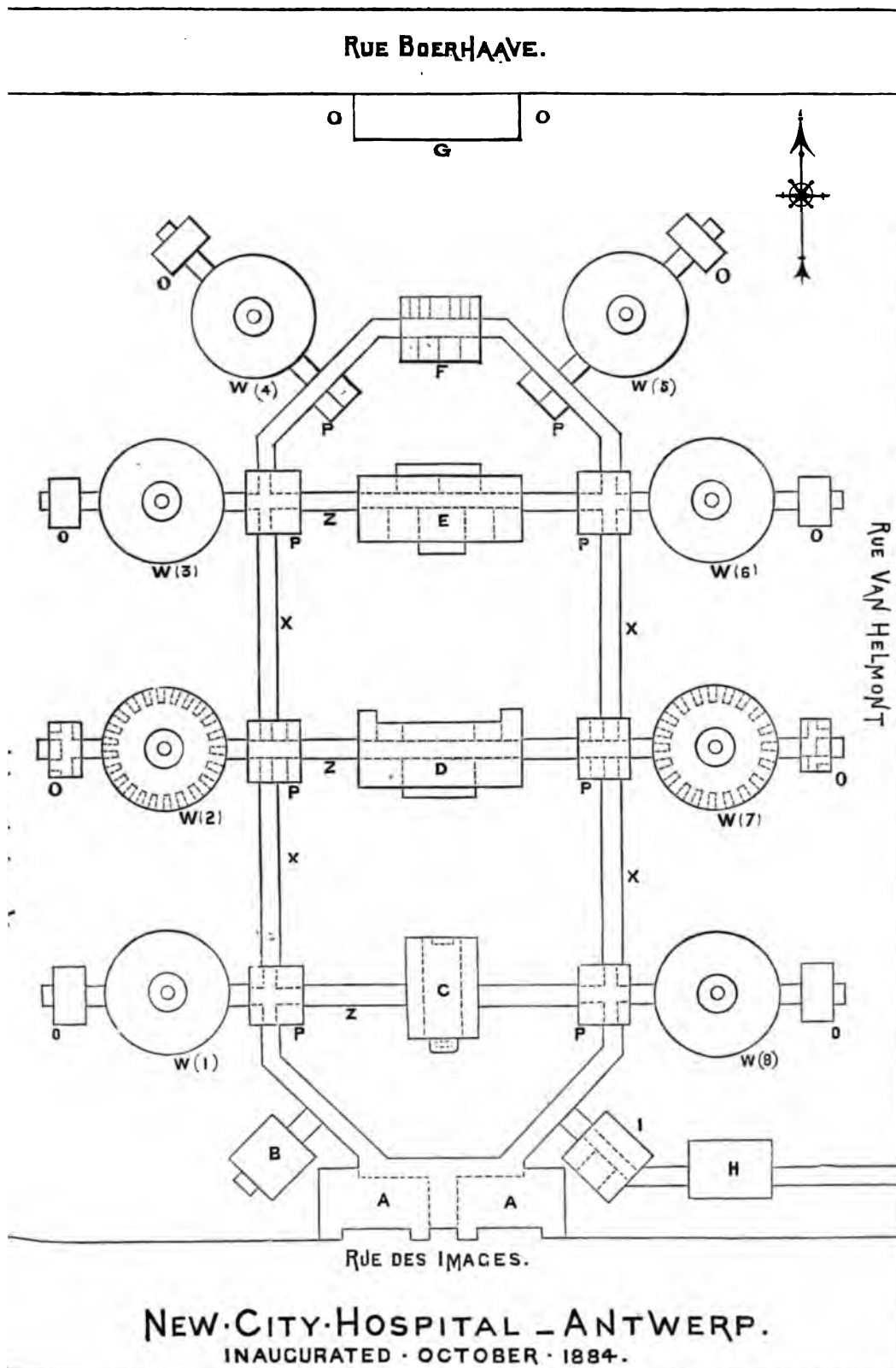
The ventilation of the circular wards is effected principally by artificial means, by channels carried up the centre of the towers, conveying the diseased air outside on the louver placed on the top of the tower roof. They are heated by hot-water pipes placed round the walls, and there are no open fireplaces anywhere.

On the outside of the tower there is a square turret or annexe, attached by corresponding small corridor to the tower, which contains lavatory, baths, closets, and hot chamber. On the inside aspect of the tower, and connecting it with the enceinte, is a covered way and short annexe, containing two private or solitary wards, doctors' and nurses', and visiting rooms.

On the west side of the Grand Bureau in front lies a square house or block of two storeys connected with the general enceinte by a covered way, and containing the operating theatre and instrument-rooms. On the east side, similarly situated, lies the mortuary establishment, of a very complete and modern character, comprising *morgue* with sixteen slabs, necrotomy room with two slabs, laboratory and instrument rooms.

Beyond this lies the funeral establishment, with coaches, ambulance carriages, and litters, connected with the street by gate for the exit of processions and burials. The chapel is of course a Roman Catholic one, fitted with the usual altars, shrines, &c., and is provided with gallery all round for the use of the sick of the upper or second floors, opening into the corresponding cross corridors, and towers beyond them right and left. The kitchen or cuisine is fitted up with the most modern apparatus for cooking in all its branches. There are no open fire-grates, and all the heating is done by furnaces and steam, so that there is no messing with ashes and cinders.

The chief cooking-range is placed in the centre of the hall, with descending flue, and a large flat plate on which are the various orifices for pans and kettles for cooking, &c., and ovens are placed at the sides. Along in the middle of the chamber further on is the apparatus for boiling the soup and bouilli, the standard diet of the sick, in large kettles, like kettle-drums, which are swung on horizontal pivots for the convenience of turning over for emptying their contents into the cans for service in the wards. These kettles are heated by steam admitted into their double linings, which can be turned on or off in each separate drum as required, and no special furnace or flues are supplied for them. Round the sides of the big kitchen are disposed other and smaller steam-heated apparatus for making various other articles of diet, as coffee, cocoa, vegetables, potatoes, puddings, milk, &c. The two other smaller kitchen rooms adjacent are intended for the collection of the dietary material, and its allocation to its uses, and then to the separation and distribution of the various articles to the sick wards. Access on the same levels is had along the different cross covered ways by means of carriages, and to the towers and apartments.



A A Administrative Block.
 B Operating Theatre.
 C Chapel.
 D Kitchen and Pharmacy.
 E Residential.
 F Bathing Establishment.

G Laundry.
 H Ambulance and Coach-shed.
 I Mortuary and Post-mortem Rooms.
 w (1), w (2), &c. Circular Wards.
 o, o, &c. Ward Offices and Baths.
 P, P Private Wards and Offices.

x, x, &c. Corridor, Enceinte, Connecting Administrative Block Wards, &c.
 z, z, &c. Cross Corridors, connecting Kitchen, Chapel, and Residential with Wards, &c.

There are also in this central building accommodation for the dining of servants and nurses, &c., and for the conversation and recreation of any patients who are able to move about.

On the north side of this block, and looking to the third court, is the pharmaceutical establishment or dispensary, where there is a finely fitted-up laboratory, together with store-rooms and offices—all communicating with the central cross corridor.

The bathing establishment is of an elaborate character, and fitted up with the most modern apparatus. It comprises male and female single baths (hot and cold), Turkish apparatus for hot and moist air, douches of all sorts (hot and cold), massage chamber, and various requisite offices attached. The baths are connected with the rest of the levels by the cross covered ways at the north end of the avenue, going to the last of the towers.

The residential building, just opposite the baths in the fourth court, is of three storeys, and contains offices and private rooms for the use of the resident medical staff and other officials and sisters.

A stroll round the galleries may probably give a good idea of the internal arrangements of the lobbies and rooms all round. If the lower gallery be entered on the left of the grand entrance, it will be found to be well lighted on each side by windows. The door of the operating theatre on the left is then reached, and subsequently the cross gallery leading to the first west tower and to the chapel on the right side. The circular wards can be entered from here. Passing along the covered way and its annexe, containing the doctors, nurses, and solitary wards, the visitor passes round the central glass tower inside, returning into the grand gallery. He next passes north on to the next cross corridor leading to the second west tower, with its circular ward on one side and the kitchen on the other, which may also be visited, as before detailed.

Passing on still further along the main gallery, the intersection of the cross corridors of the third west tower and the residentiary are reached; and going on beyond this a little brings the visitor to an angle in the passage turning to the right. Here he meets with the door leading on the left into the fourth tower, with its circular ward; and, lastly, at the far end (north) he reaches the bathing establishment. Passing through this, he enters the Eastern Grand Gallery, and notices similar doors and cross corridors as he walks along south as seen on the west gallery, proceeding to the four towers on the east side, and the residentiary, kitchen, and chapel in the courts, till he arrives at the entrance of the Morgue, lying on the left, and lastly, the grand entrance at the gate. There are flights of stairs at different select positions in the cross corridors, leading up to the second storeys of the galleries above, which are similar in arrangement to the lower ones, and give access to the second storeys of all the towers outside, and of all the buildings inside the courts, but differ in being open above to the air. The towers themselves may be roughly estimated at about 61 feet in diameter inside, and 36 feet in height of walls inside, *i.e.* they are nearly about half square cylinders, and would have therefore above 105,192 cubic feet of capacity *en masse*, and 2,922 square feet in area. Now as there are 20 beds in each circular ward of the tower, this estimate will give to each bed a gross amount of 2,629 cubic feet of space, including everything. The total accommodation for the sick in the whole towers will amount to $40 \times 8 = 320$ beds, but as there are 2-4 extra beds to each ward, the grand total will probably be nearer 350 beds altogether.

The staff of attendants must be very numerous to manage such extensive premises efficiently, as there would be 8 nurses to each tower, or 64 total; and doctors, apothecaries, clerks, bathmen, cooks, storemen, laundrymen, &c., must bring up the total number of administrators to 150 at the nearest estimate.

It may be submitted in an engineering point of view, that edifices on the Edwardian castle principle could only

be applicable to horizontal flat sites of ground, at Carnarvon, and Conway, in North Wales, and unsuited for sloping or hilly situations.

It will be apparent that the circular wards will be less ground and space than the rectangular wards same number of beds, as the latter would require over 80 feet long for the 10 beds a side, an breadth of 60 feet, a height of 36 feet, an area square feet, and a capacity in the gross of 162, feet for the two wards.

However, in the case of this new hospital, of ground space for sick wards has been discovered increased space devoted to administrative building interior courts, so that the total ground taken up greater than in the older establishments. But advantage secured by this modern method of depends upon the complete isolation of wards, access afforded to all parts of the building, and external ventilation which is provided.

HOUSING THE WORKING CLASSES NEWCASTLE-ON-TYNE.

THE annual report of Mr. H. E. Armstrong contains an interesting supplement on the sanitary condition of the Street (West) and Back George Street. It appears the excellent plans accompanying the report, as unfortunately we are unable to reproduce) that the arrangement of the houses is rather peculiar. The block of houses is placed between two streets, each house is two stories in height and has one frontage towards each street. On the ground floor there are two entrance doors (each frontage) connected by a through passage. There are two living rooms on this floor with a steep flight staircase between them at right angles to the passage. The staircase terminates on the first floor at a small landing, and doors on either side of the landing open into two living rooms. Each of these living rooms is also each of those on ground floor, is provided with a window and fireplace. Each first-floor living room opens into a small bedroom having a window but no fireplace.

The basement tenements are approached by flights of steps in the back and front areas, and consist of a living room entered from the area, and a small bedroom from the living room. Each room has a window. The living rooms have fireplaces. The water closets (for the entire building), ash-pits, and coal cellars, are placed under the footways, and approached from the footways. Each building, it will be seen, consists of two tenements, each of two rooms each in the basement, two tenement rooms each on the ground floor, and two tenement rooms each on the first floor.

Mr. Armstrong considers that the greatest defect of these houses is that of insufficient ventilation, due to causes, *i.e.* position, structure, and capacity of rooms.

The position of the basement tenements, placed back to back, renders through ventilation impossible. The water-closets and ash-pits are placed in the encumbered areas which light these rooms, their light is drawn through the windows and doors of the living rooms. These evils are intensified by the small size of the rooms. The living rooms average 12 ft. by 15 ft., and the bedrooms about 8 ft. by 15 ft., and the height varies from 8 ft. to 8 ft. 6 in. Thus the former rooms contain each about 1,450 cubic feet, and the latter about 1,050 cubic feet.

The bedrooms having no fireplaces are typical examples of what the report designates as 'well-rooms' having no other openings than door and window, both of these being placed at the same corner of the narrow apartment, which is badly ventilated even when the door and window are open, because the air entering by one aperture passes directly out by the other, leaving stagnant the atmosphere of three-quarters of the room.

On the first floor the bedrooms are also 'well-

iced back to back, no through ventilation is

years ago an attempt was made to improve n of the rooms by certain structural altera- : proposed to convert each pair of back-to- nements into one dwelling. This proposal it in three instances only.

tive required was to make an opening from of the 'well-room' into the kitchen, either : the door to that end, or by putting in an ator there. It will be evident that either of is defective, inasmuch as the only ventilation that of interchange of air between the two unitary arrangement under all circumstances, bad in case of infectious disease in the enty-eight cases of cellar 'well-rooms' the l the position of the doors, and in as many ventilators were introduced. In eleven ing has been done.

tion of the 'well-rooms' on the first floor ined by an opening from the dead end of ircase, which was itself to be lighted and m the roof. A swing sash in the wall ; room and staircase was to ventilate the ive additional light to the latter. These e proposed, but, with the exception of the carried out. The attempt to ventilate the cannot be called a success, owing to the of the staircases ; currents of cold air blew pants of the bedrooms through the newly- s, which were speedily papered over. In Armstrong very reasonably points out, the o small to allow of their being ventilated nort to the occupants.

er defects in the dwellings are described, and of the inhabitants from various diseases is the death-rate of the borough, to the detri- mer, as may be imagined.

ations insisted on some four years since have mproved the dwellings, Mr. Armstrong pro- lical changes, of which the following is his

should be done away with as human

ooms' on the first floors are too small for ements, and are incapable of proper ventila- should be thrown into the day rooms, which tements of one room each, suitable for ; or the two small tenements on each flat ted into one of good size.

tion of staircases and passages should be e way proposed in 1880.

and sinks should be provided for each

ble that the privies and ashpits should be h in favour of some more rapid form of such as either ash-closets after the Notting- or water-closets with removal of ashes, be found most practicable.

of water-closets, drains, sinks, &c., should the usual manner.

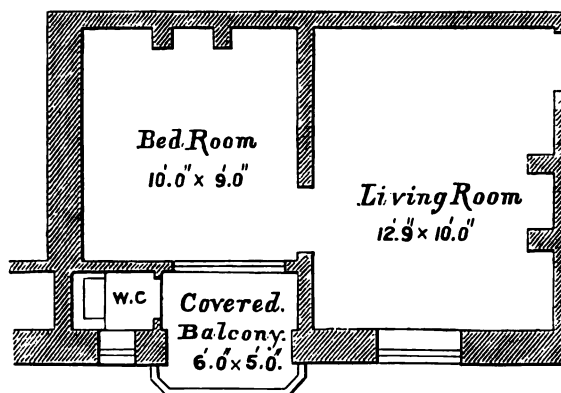
sted so largely from this able report that we left in which to reproduce the author's very is concerning the necessity of providing a apply to each tenement of such dwellings.

DWELLINGS, SEWARD STREET, ST. LUKE'S, E.C.

TWO-ROOM TENEMENTS.

1 Central Dwellings Co., of 57 Conduit er Square, are meeting an undoubted want ildings for those workers who cannot and : from their sphere of daily labour. Not- he concessions which have already been

made (not without pressure being brought to bear) by the various railway companies, the travelling facilities are by no means all that the working class require, and to give all that is demanded would entail considerable interference with a large section of the community who are entitled to by their position and are prepared to pay for a certain amount of exclusiveness in their daily journeys. It must also be remembered that a large number of working men insist upon living in a central position, and like to be able to get to their homes at irregular and uncertain hours, and many a man with a small family prefers to live in two rooms in central London rather than occupy three rooms in the suburbs. Again, there are many widows and single women who are compelled to live in a position from whence they can more readily go in search of the piece-work for different manufacturers and employers, and to whom one or two extra railway journeys, however short, would often mean a serious waste of time and opportunities. Bearing this in mind, the directors have wisely



determined to provide, not only the regulation three-room tenements, but also single rooms and two-room tenements, this latter description being the subject of our present illustration. These buildings are now in course of erection in Seward Street, St. Luke's, E.C., and the somewhat unusual feature of a private balcony to each tenement calls for a passing remark as evincing the interest taken in consulting the wants of tenants who can readily and practically appreciate the results of such forethought. Even in the better quarters of London, during the fine weather, the balconies and spaces over the porticoes are much used by the inhabitants who have no ready access to the squares and gardens in the neighbourhood, and it goes without saying that a balcony of the description shown can be made to serve a like useful purpose, more particularly as it has the further advantage of not being open at the top, but is formed in a sort of recess. The water-closet, too, is cut off from the rooms, which, from a sanitary point, is undeniably an important feature. A scullery, or wash-house, with coppers and sinks, common to four such tenements, is provided on each floor, entered from the same landing which gives access to the living-room. Over the entrance door to each set will be a swing fanlight for ventilation, this being a point of construction which has hitherto escaped the attention of most builders, and the directors of the company have determined to introduce ideas of comfort and sanitary well-being which, apparently slight in theory, are of great practical value in reality, and although not expensive in the first place, are often overlooked by the ordinary builder, and not discovered until too late to carry out. In the SANITARY RECORD of Oct. 15, 1884, p. 154, reference will be found to the dangerous state of the staircases to many buildings of this class, owing to their slippery nature, and to obviate this danger it is now proposed to adopt a special form of construction to which we will refer when the definite shape is decided upon.

We have said there will also be a number of single rooms provided, and in each case a separate water-closet will be allotted, experience proving that liberality in this respect is the most paying policy, independently of the sanitary consideration. Fireproof construction will be used throughout, with a drying-ground on the roof, which will be paved with asphalt.

The exterior promises to be of more attractive appearance than is generally given to such blocks, for there is no denying that a sombre and stern look characterises the majority; but, in the example before us, there are but six stories in height instead of the customary seven, and by a skilful use of red brick pilasters, panels, and window dressings, there will be a dignified effect, more the result of careful design than expense of material.

Another peculiarity is the absence of *basements*, as these rooms find no favour with good tenants, and can never be satisfactorily lighted, and are often difficult to drain. Moreover, as a matter of pounds, shillings, and pence, it is found that they are more expensive to build than any other floor. There are other points of interest which are being developed, and as the plans will vary somewhat in each of the blocks (there are seven in all), some comparisons may be instituted, and will be referred to as the works further proceed. They are now rapidly being pushed on with by Messrs. Brown, Son, and Blomfield, under the superintendence of Mr. Marshall N. Inman, architect to the company.

It is a sign of the times that notwithstanding the semi-private nature of the undertaking, the Lord Mayor will shortly lay the foundation stone, and such a mark of approval is a strong testimony of the benefits which may accrue, not only to the tenant, but also to the investor, who is not averse to a pecuniary recognition of his philanthropy.

THE OPENING OF THE SOUTHBOROUGH WATERWORKS.

On the 27th ult. the ceremony of declaring the new waterworks at Southborough open was performed by Mr. Deacon, of Mableton. Southborough has grown in a few years from a village to a town, and, as usual in rapidly-growing places, it has been a matter of some difficulty for the sanitary authorities to keep abreast of their work. By the completion of the present works, a village almost without paving, lighting, drainage, or proper water supply has been finally converted into a town with a good water supply, well paved, lighted, and drained. The late Dr. Fairlie Clarke, who was for some years on the Local Board, did yeoman's service in making the water supply a burning question.

Owing to its position on the crest of the hill between Tonbridge and Tunbridge Wells, the supply of water in the neighbourhood was limited, and pumping was a necessity. Many of the springs in the neighbourhood are similar in analysis to the famous chalybeate spring at Tunbridge Wells, useful medicinally, but unfit for dietetic purposes. In Benthall Wood was a spring of which Dr. Frankland reported—'It is of excellent quality for drinking, and being also very soft it is well adapted for washing and steam purposes.' This spring, after many difficulties, the Local Board have secured. At the foot of the common a pumping-engine has been erected, worked by two gas-engines. At the summit of the hill a reservoir has been made, from which all but a very few houses can be supplied by the pressure of gravity alone.

Into this reservoir Mr. Deacon turned the water on May 27, after which some demonstrations were made to show the pressure of the water and the height to which a jet could be thrown in case of fire, and finally there was a public luncheon in a marquee beside the reservoir.

DR. KOCH, well-known by his numerous researches on bacteriology, has been named Professor of Hygiene at the Berlin Medical Faculty.

EXHIBITS AT THE INVENTIONS EXHIBITION.

SOAPS, DISINFECTANTS, &c.

MESSRS. JAMES ALEXANDER & CO., Paradise Street, Lambeth, at Stand 272A, South Central Gallery, show some elegant toilet soaps, their principal specialty being 'Savon Hamamelis,' or Hazel Soap, in which the extract of *Hamamelis Virginica*, or common Witch Hazel, forms a component part. It is almost needless to add that the drug *Hazeline*, now so popular here, is made from the same plant. The witch hazel is a plant indigenous to North America, and the green bark of the tree has been used from time immemorial by the Aboriginal Indians for poultices, its healing powers being remarkable. Incorporated into soap in the form of a pure distilled extract, its soothing effects upon the skin, particularly if rough or chapped, being perceptible after one or two applications. It is also admirably adapted for washing the head and hair. It glides smoothly over the skin, and the lather it makes is of a lasting character; for shaving purposes, too, it is a real luxury. Owing to the chemical constituents of Hamamelis less alkali is required in its manufacture than in most other soaps. A casual visit to Messrs. Alexander's works favourably impressed the writer with the scrupulous care exercised in each department and of the purity of the ingredients used. The motto of the firm from the time they commenced business has been 'Pure Soap,' an excellent standard which they have doubtless carried out. The Hamamelis soap is put up in tablets, scented and unscented, in natural colour; another kind is made as a transparent soap. Savon Hamamelis is a decided acquisition to the list of toilet soaps, and may be confidently recommended as a soothing and healthy soap. In addition to the soaps a tooth powder and a pomade are also made, in which the extract of Hamamelis is also introduced with excellent effects.

Mr. Eugene Rimmel, 96 Strand, W.C. (1,436) has a case containing a good selection of elegant toilette requisites, of which sanitary perfumery forms a portion. A new apparatus is shown named the Myrogene, intended for extracting the perfume from fresh flowers.

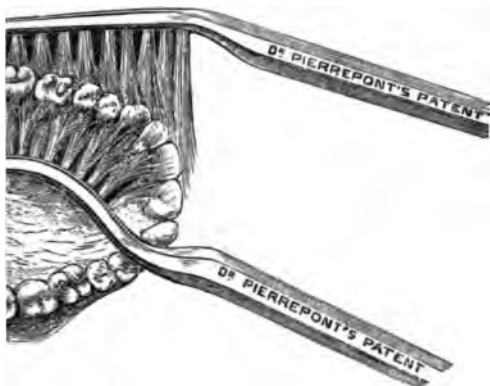
At 1,466 Messrs. F. C. Calvert & Co., Bradford, Manchester, have a case containing samples of their well-known preparations connected with the coal tar industry, of which they were the original manufacturers. The exhibits comprise carbolic acids of various degrees of purity, and disinfecting powders of different strengths. Experts will no doubt be attracted by the splendid series of sulphocarbolates, many of which are exhibited for the first time. Amongst the novelties may be mentioned the 50 per cent. carbolic disinfecting powder, manufactured under patent, presenting the powerful disinfecting properties of the acid in a highly concentrated form, yet one that may be handled with perfect safety. Another is a novel preparation, named 'Dento-phenoline,' a mouth-wash or dentifrice water of exceeding fragrance, and one likely to become a favourite when better known. Another of the carbolic preparations is the ointment fast coming into favour as a household requisite. There is also a collection of carbolic soaps, including toilet, household, medical, and dog soap, all which can be recommended, their excellent properties being well known.

The little domestic vaporiser, in the form of a small night-light stand, is very useful for purifying the air in sick rooms, and in cases of whooping-cough, diphtheria, &c. A special night-light is used in the appliance, suitable alike for tropical climates or home use, the top being formed of a dished surface, into which is placed carbolic powder or liquid acid, which will give off its vapour at a gentle heat for three hours, when it can be renewed if necessary. Messrs. Calvert's preparations of carbolic acid may be relied on as containing a guaranteed percentage in each article.

Mr. Jas. B. Austin, Lime Kiln Dock, Hotwells Road, Bristol, has a case at 1,461 of various requisites containing

olic powder, but, as we have failed to obtain samples, we are unable to speak of their merits.

Dr. Evelyn Pierrepont, 22 Old Burlington Street, W., at the Central Gallery (1,735), exhibits some new and ingeniously contrived toothbrushes to be used in pairs, shown in illustration. Dr. Pierrepont argues that too little attention has been paid either by dentists or others to the shape of tooth-brushes, although he is told to take all possible care of their teeth, he points out that the ordinary tooth-brushes are at all adapted for cleansing the inner side of the teeth, which require as much care as the outer surface. His brushes may be described as concave and convex



regards the bristle 'line,' the former being used for the interior and the latter for the exterior surface. The bristles are also bent, and the brushes themselves are smaller than the ordinary ones. The bristles are of different lengths to suit the requirements of the teeth. The brushes are, of course, used separately, and are well adapted to carry out the idea of the inventor. They are shown in several different sizes, and in three separate lengths of bristle, for hard or soft gums, and besides cleaning the surface, penetrate the interstices between the teeth. The advantages offered by these tooth-brushes doubtless commend them to the public.

CHEMICALS, PIGMENTS, &C.

South Central Gallery.

Mr. H. B. Condry, Battersea, S.W., at 1,445, has a display containing some valuable chemicals, including a new permanganate Disinfectant, and a white lead made by a new and rapid process, harmless to the workmen. Condry's display, of which the exhibitor was the inventor, has, in every respect, been surpassed by the new disinfectant, which comprises some valuable improvements. It combines the principles of a disinfectant, a deodoriser, an antiseptic, a neutraliser of ammonia, and a precipitating agent, and has the further characteristic odour of ozone, which has not previously been united in any one compound. In the manufacture of this disinfectant an alkaline salt is first produced, out of which potassium is crystallised, the mother liquor consisting of an alkaline salt in which permanganic acid replaces its valent of sulphuric acid. It also contains a certain quantity of sulphate of alumina, to which it partly owes its power of increasing the oxidising effect of the permanganic acid and of neutralising ammonia, as well as its antiseptic quality. When placed in contact with decomposing organic matter, the sulphate of alumina plays a part that would be taken by sulphuric acid; and by adding more sulphate of alumina a greater amount of ozone is obtained. One part of this disinfectant to four parts of water furnishes a strong disinfecting fluid, besides acting in this capacity is a good antiseptic, neutraliser of ammoniacal gas. Its effect, therefore, in decaying matter is not only to thoroughly disinfect

and destroy all odour, but to neutralise ammonia, and to arrest decomposition; thus preserving its value for future employment. While preserving all the above-named properties, this fluid can be made entirely inodorous. A mixture consisting of a teaspoonful of disinfecting fluid to a quart of water will render tainted provisions pure, and used in dairies or larders will have the effect of preventing provisions from becoming tainted. It is also claimed that it is the most perfect water purifier possible, as the base of the permanganate salt being insoluble, forms a flocculent precipitate which clarifies the water and carries down all suspended matter.

Another preparation shown is a new Medicinal Salt, Hyposulphate of Soda. This salt is introduced as a useful substitute for sulphate of magnesia (Epsom salts), combining all its useful properties, with other advantages, such as being antiseptic and less drastic in its effects.

A new method of decomposing chloride of sodium and potassium in aqueous solution is also exhibited. This produces a hyposulphate of either alkali in crystalline form, and chloride manganese in solution. At a low red heat these latter salts can be converted into sulphate for the manufacture of carbonate of soda or potash. The means employed by Mr. Condry in this process are so simple, that sulphate of soda or potash for alkali or glass making may be manufactured without the aid of vitriol chambers or reverberatory furnaces, and consequently with a much less expensive plant; in fact this process is calculated to effect a complete revolution in the manufacture of these extensively used chemicals. Mr. Condry is quite prepared to sell his patent outright or to grant licences for the use of his process.

Knowing that any improvement in the manufacture of white lead, by which the evil effects of the old stack system is avoided would be read with interest by the subscribers to the SANITARY RECORD, the writer visited Mr. Condry's factory, and was shown the entire process. In saying that it is rapid, the inventor hardly does justice to the importance of his system, for when it is stated that he accomplishes in seven days what by the old stack system requires four or five months to produce, and without any of the danger to health inherent in the Dutch system, some idea may be formed of its commercial value. The inventor produces white lead of an unvarying uniform quality, a result which cannot be effected by the Dutch process, as change of weather and inability to control the temperature of the stacks greatly interfere with it, identical in composition with the very best white lead made by the stack system, viz. $2(\text{PbO}, \text{CO}_2) + \text{PbO}, \text{HO}$, and this is effected without the hands coming in contact with the lead, until it is withdrawn from the drying kilns. The workmen then wear thick leather gloves on their hands and respirators over their mouths, so a fair idea may be formed of the valuable hygienic as well as commercial advantages offered by Mr. Condry's new process. Briefly explained, the process is as follows:—The pig lead is first melted and then granulated; it is then placed in vats, and, with the addition of acetic acid, and its own heat, becomes oxidised; it is afterwards pumped to another set of vats, where, by the addition of an alkaline carbonate it is precipitated, and assumes the form of a thick paste. In this state it is removed to filter presses, where the superabundant liquid is withdrawn, and is then removed in small earthen pans to the drying kiln, in which it remains about three or four days. Being then in the form of a dry cake, easily broken up, it is placed into casks and headed up, ready for transport to the grinders, when it is transformed into the semi-liquid state by means of linseed oil, and is ready for the painter to mix. It would be impossible to produce finer white lead than that made by Mr. Condry's system, and from specimens of covering of other leads shown the writer, he is inclined to think it is some 20 per cent. superior in covering power. Another advantage gained is that a valuable by-product is secured, viz., acetate of soda, which is used in the manufacture of acetic acid. When the merits of the Condry White-

Lead are better known to the public it will doubtless take that position in the commercial world to which it is fairly entitled.

Messrs. J. B. Freeman & Co., Grove Works, Battersea, S.W., exhibit (1,448, South Central Gallery), examples of their patent non-poisonous White Lead, which is worthy the careful attention of all sanitarians. This white lead, though innocuous, must not be confounded with the zinc whites, of which so much has of late years been advanced; for while possessing all the qualities of the best white lead made by the old system as to density, ability to withstand weather, covering power, &c., it is as free from danger to health to the workers who make or use it as the zinc whites, and a house may be painted with it without the removal of the occupants, and without any smells or ill effects resulting from its use. At the same time it may fairly claim advantages not possessed by the orthodox white lead. As in the case of the preceding white lead described, the writer has visited Messrs. Freeman's works and made himself thoroughly acquainted with the details. Messrs. Freeman have been manufacturers of white lead for generations, and have been fully alive to the injuries to health incidental to the old stack process, and the beautiful, new, innocuous pigment they have succeeded in producing has been the result of many years' exhaustive experiments, and great expense. This lead also differs from the ordinary kind in being a 'sulphate' and not a 'carbonate' of lead. But it may be said that a sulphate is not a pigment in the sense white lead is generally understood to be. This is correct; but, as will be presently shown, an addition made to it, which embraces the patent the firm have taken out for their commodity, secures the desired end. The mode of manufacture is ingenious and rapid, the result being attained within a week as against about four months by the stack system. After the pig lead is melted it is poured through a machine which quickly forms it into small flakes, or 'feathers'—to use a trade term—on to an inclined plane, up which it is carried and thrown off. This machine is the invention of the firm, the object being, when the operation of making white lead is commenced, to secure the largest amount of surface to be acted upon by the acid. The lead is then collected and placed in vats, which are specially constructed to produce rapid oxidation of the metal. An acidulated liquor of acetic acid and water is then introduced to the mass; and, without going into too many minutiae, for every 5 tons of lead so treated sufficient is carried down in the form of a liquid each time it is drawn off to produce 900 lbs. of sulphate of lead. Sulphuric acid is then introduced into the liquor, when the lead is deposited in a beautiful white precipitate. This is now taken out and washed with water, and then deposited in large vats or backs. When these vats are nearly full they are emptied of the sulphate of lead, which is the real nature of their contents, and which is of the consistency of a thick paste. It is then dried in the usual way. The great value of this invention has now to be imparted to it. It has already been pointed out that sulphate of lead is not a pigment for a painter, so it has to be turned into one. To this pure precipitated sulphate of lead a certain proportion of oxide of zinc is added, and then submitted to the most important part of the process, whereby a complete change is effected in its properties, and a body and density much in excess of the old white lead is imparted to it; the compound before treatment weighing only 112 lbs. per cubic foot, and after treatment over 200 lbs. per cubic foot. This marvellously transformed compound, for it has as yet not been clearly shown by chemists: how the increased density is obtained, is the non-poisonous white lead which the writer is describing. The greatest density of the best white leads made by the old system is about 184. It will thus be seen that Messrs. Freeman's lead is heavier than the ordinary kinds, and, furthermore, it only takes about 7 lbs. of oil per cwt. to mix it, as against 8 or 8½ lbs. required for the others. Its

colour is whiter than that of any other lead, and it has the further advantage of retaining it under the most adverse atmospheric conditions. Materials coated partly with this white lead, and partly with the ordinary kinds, that had been exposed to the action of sulphuretted hydrogen, were shown to the writer, in which Messrs. Freeman's lead had not changed in colour, while the other half had become a deep brown, almost amounting to a black. The reports of Dr. H. C. Bartlett, F.C.S., &c., Mr. A. H. Church, M.A., F.C.S., Professor of Chemistry to the Royal Academy of Arts, Sir Chas. A. Cameron, M.D., President Royal College of Surgeons, Ireland, Vice-President Institute of Chemistry of Great Britain, the late G. W. Wigner, Esq., F.I.C., F.C.S., &c., more than prove the facts here advanced, while the number of testimonials in possession of the firm from painters and decorators in various parts of the kingdom are unanimous in pronouncing this non-poisonous white lead as the best they have ever used. The value of the invention to the manufacturer, as enabling him to carry on his business with a mere minimum of capital as compared with what is required by the old Dutch process, has not been adverted to, but it is nevertheless very great. Thus in every point of view a greater advantage is secured, a smaller amount of capital is required for the working, a larger proportion of lead of a superior quality is produced, and, what is of far greater importance, danger to health is avoided; a benefit not to be overlooked by sanitarians. Messrs. Freeman also exhibit a case of non-poisonous colours of almost every variety of shade.

The Patent Liquid Fireproof Cyanite Paint Company, of Chelsea, and 82 Bishopsgate Street, Within, E.C. (1,440, Stand 266, South Central Gallery), exhibit their patented material bearing the above title. It would probably be more correctly described as a priming than a paint, notwithstanding that it is a preservative to wood, as well as a powerful agent in arresting the progress of fire. It is applied with a brush in the ordinary manner, one coat being necessary in all cases, and sometimes two coats are advisable. One gallon will cover about 500 square feet for the first coat, but the second will take only about half as much. It penetrates and so incorporates itself with the wood a certain depth of the surface, and consequently cannot be scraped off unless the material is taken with it. In this condition it has somewhat the appearance of a wood stain, and for certain purposes these coatings are sufficient; but it can be painted and varnished without any detriment to the cyanite. Anxious to witness its effect under fire, the writer was accorded the privilege of attending a demonstration a few days since in the open air, when it was subjected to severe tests. A flight of wooden stairs were fitted up, to which two coats of the cyanite had been applied. These were well soused with benzoline, back and front, and surrounded with shavings similarly treated, and set light to. As may be supposed, the whole structure was soon enveloped in strong flames, that gave off intense heat, yet, strange to say, they burnt themselves completely out in a very few minutes, leaving only a slightly charred surface that did not penetrate the wood more than one-eighth of an inch; and with that exception the stairs were as sound as before. Two large packing-cases, standing upright and open in the front, were also operated upon. To more effectually show the difference, one of these had not been coated with the solution; and, it is almost needless to say, was entirely burnt in a short space of time. Owing to the flames being concentrated in the interior of the other case, they remained in force a longer time than in the case of the flight of stairs; but they, too, became extinct, though owing to the intense heat generated, and to a strong breeze, they now and again showed signs of vitality. Sufficient, however, was demonstrated to show that the fire could easily have been extinguished when at its height with ease had the usual appliances been used, and this is of course the great advantage to be obtained

ie use of the cyanite. The report of Captain Shaw, superintendent of the London Fire Brigade, who has considerable attention to the invention, is appended:—'The wooden stairs cyanited resisted strong as well, and practically were not weakened. I have doubt that cyanite would be most useful in preventing spread of fire, and I should be glad to see it more. I consider that wooden stairs cyanited are in case much safer than stone.' So fully impressed are principal fire insurance offices of the value of cyanite their rates of insurance are materially reduced for all things treated with it: in the case of theatres from and upwards per cent. to 10s. 6d. and upwards, which is a most practical acknowledgment of its worth. I learn that Sir William Harcourt's new Hampshire mansion has been completely cyanited by the company, having witnessed tests similar to the above.

essrs. Griffiths, Berdoo, & Co. (Sanitary Paint Co., Ltd.), 34 Leadenhall Street, E.C., and Liverpool (2) show their non-poisonous colours, and Knight's (1) white, a non-poisonous substitute for white lead; Mr. Thos. Griffiths, 1 Queen Victoria Street, E.C. (3) exhibits a similar preparation.

GAS AND OIL LAMPS, &C.

East Annex.

essrs. Wm. Sugg & Co., Limited, Vincent Works, Westminster, S.W. (1,479), at an attractive stand, combine the scientific and the useful, exhibit the different burners with which their names have become associated—street-lanterns, sun-burners, gas-governors, &c. scientific apparatus comprise an illuminating power, improved cubic foot measure and meter, Filling's, Harcourt's Patent Aerothermometer, Joslin's Patent atomizer, an improved Canadian pattern, Letheby Photometer, and a jet photometer of ten-candle test. All these meritorious inventions, and will be appreciated by gas engineers. But the most unique feature connected with the stand is the 'Cromartie' Gas lamp and Gaselier, which is intended to become a favourite with all who use gas as a lighting medium. The burner is the ordinary fish-tail kind. It is surrounded with concentric tubes, one of which supplies air to keep up combustion, the other carry off the products, and this can easily be arranged to by means of an extended tube between the ceiling and flooring boards above, and so into the outer atmosphere. Each of the jets is covered with a small inverted shade, not unlike that of an incandescent electric globe, and the flame curving inwards to the tube has a pretty effect. The quantity of gas consumed by the burners is by measurement only two feet per hour and gives considerable illuminating power. The necessity of the effect is increased by covering the lights with different coloured shades, and the invention can easily be applied to brackets or any form of gas-lighting.

and 1,480 is occupied by The Manufacturing Company, 43 Farringdon Road, who exhibit Bromhead's automatic Dry Gas Regulator, intended to regulate the admission of gas after it leaves the meter. The word 'Bromhead' is used to distinguish it from those in which mercury and substances are used, the material employed being a leather diaphragm, which rises and falls with the valve regulating the supply.

J. S. Fairfax, 3 St. Paul's Road, Camden Square, (1,492), shows a chromatic stereoscope on stand, to which a mineral-oil lamp is attached for night use. By this combination charming effects of light and colour are obtained. and 1,493 is occupied by Kynoch & Co., Limited, Piccadilly, who show a collection of mineral-oil lamps of various designs, the novelty being in the burner, which is called a 'circular wick duplex.' It is, in reality, a burner with two flat wicks, each operated upon independently, as in the ordinary duplex, the advantages of easy manipulation as compared with a circular wick piece, as there is no fear of the half-circular wicks singeing evenly.

The Albo-Carbon Light Company, 132 Horseferry Road, S.W., make a handsome display at 1,495 of their special mode of burning gas by introducing a variety of designs of the 'containers' for the albo-carbon, suitable for all descriptions of lights, from the office to the drawing-room.

Mr. Wm. Tice, Thornilee, Sutton, occupies 1,501 with a collection of his dry gas regulators, and a street gas lamp regulator. He also shows a simple mode of warming railway carriages.

Browne & Co., 186 Piccadilly (1,503), contribute a commendable collection of mineral-oil lamps, their burner known as the 'Mitrailleuse' being a prominent feature.

Mr. Kinnear (1,505), 91 Finsbury Pavement, E.C., shows a self-lighting gas-burner and tap, to which a governor is attached, by the use of which it is claimed that 25 per cent. of gas is saved, and immunity from explosions secured. The gas is really never entirely turned off in this tap, a minute blue flame unseen at the burner being always alight, which is extinguished when the gas is fully turned on, but is brought into use again when the principal flame is extinguished.

Mr. W. Daniell Linslade, Leighton Buzzard (1,507) exhibits what he terms an improved oil-lamp and chandelier, which in the case of a pendant light consists in laying the wicks (flat ones) along the arms springing from the pendant from the oil reservoir. By this means the trouble of trimming is much reduced, as the wicks will last a long time. The oil reservoir being above the wicks, a free flow is always secured.

Mr. George Bower, St. Neot's, Hunts (1,517), exhibits the 'Bower' duplex regenerative gas lamp, of which an illustration in elevation is appended. This light is the outcome of patents taken out by Grimston, Thorp, and Mr. Bower himself, all of whom have worked in a somewhat similar direction, each patent being now practically merged in the 'Bower' lamp, of which Mr. George Bower is now the owner. As gas lights under one or other of the original patents may have been seen by some of our readers, it may be pointed out that the idea is to burn the gas at a very high temperature, viz., to heat intensely just as much air as is necessary for the complete combustion of



the gas. To effect this the tube down which the gas passes to the burners is surrounded by an outer tube and regenerator into which the air is admitted. The whole of the air for combustion passes through the regenerator and over a series of gills or plates that become red hot. Another tube is provided for carrying off the products of combustion which may, if desired, be carried

ried off to the outer atmosphere, but if allowed to discharge themselves into the room are far less deleterious than those produced from burning gas in the ordinary manner, as they consist only of carbonic acid gas and water; the same compound that is given off by wax or sperm. Blackened ceilings and injury to pictures or decorations are by this means reduced to a mere minimum. The candle power of this lamp in the smallest size from 16-candle gas equals 6-candle power per cubic foot in the small size, and 8-candle power per cubic foot in the larger size, or a light equal to 200 candles for less than one penny per hour, and this without the aid of reflectors of any kind. This latter fact must be borne in mind, for it has been too much the custom to measure the power of a light by the aid given it by reflectors, which, if they increase it in one direction must, of necessity, detract from it in another. The Bower gas-light can be applied to all descriptions of lighting.

tion represents the open fire, but the recent alterations have not as yet been shown in a drawing. One of these is a movable bottom fire-grating, which, by means of a ratcheted lever moved from the front, enables the fuel to be lifted towards the hot plate and adjusted to any height. This effects great economy in fuel, dispenses entirely with the poker, and ensures a good hot plate at all times for boiling or frying, which is done to perfection. The idea is not introduced as a new one, but Mr. Constantine carries out the arrangement in a more simple manner than heretofore practised, and one not likely to become disarranged or out of order. Another excellent improvement is the arrangement for the introduction of heated fresh air, which is admitted underneath and carried up a chamber at the sides of the fire box and discharged through a series of holes towards the top amidst the burning fuel, thus materially improving combustion, and tending to reduce the quantity of smoke. Mr. Constantine



FOOD AND STIMULANTS.

East Annex.

Messrs. George Mason & Co., Limited, 417 King's Road, Chelsea (1,562), have an attractive stand of their various meat extracts, including their carefully prepared Beef-tea Jelly, an admirable food for the invalid when first recovering from illness, and Concentrated Beef-tea, a powerful solidified extract of the best parts of the finest Scotch ox beef, but immediately made soluble by the addition of hot water. There are also essences of veal, mutton, and chicken, and invalid turtle soup. Another speciality is the Meat Lozenges made by the firm, which are superior in flavour to similar preparations of the kind generally.

Mr. J. Edmunds, Stonefield, Liverpool Road (No. 1,609), is present with a collection of his curry powders, and different kinds of chutneys, &c. Mr. Edmunds does not exhibit anything that has not already been announced on other occasions, excepting a new-shaped bottle for chutney, having an overlapping cover of glass lined with cork, which presents a secure seal from atmospheric air, when in use, and without the necessity of using an inner cork to the bottle. It is taper in shape, with a wide mouth, and free from any obstructions that would prevent free access to the contents.

HEATING AND COOKING APPARATUS.

Eastern Arcade.

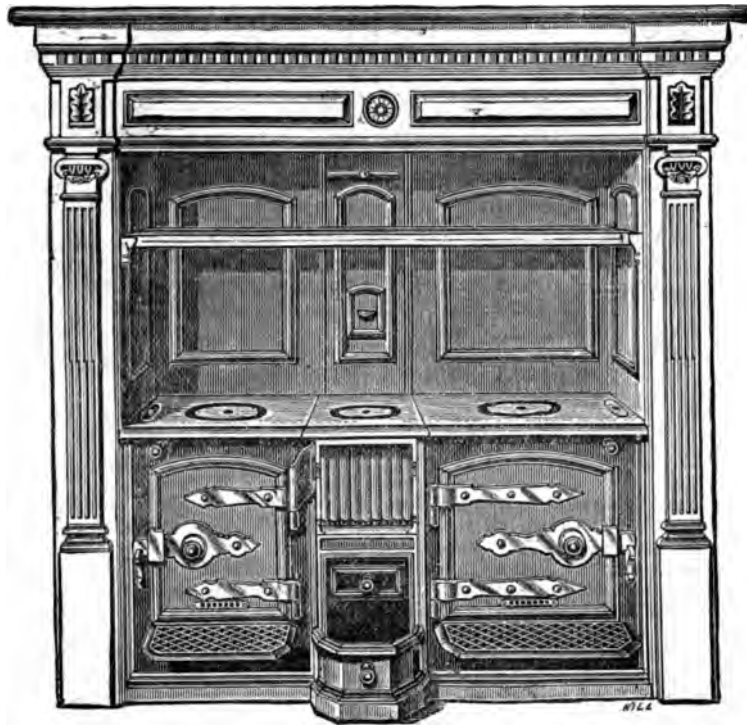
Mr. T. J. Constantine, 61 Fleet Street, E.C., at 1,536 exhibits his popular 'Treasure' Cooking Range with still further improvements. Attention has so often been called to this excellent kitchener, that on the present occasion the recent improvements only need be mentioned. They are carried out in connection with the latest prior improvement of the open fire for cooking in front. The illustra-

also exhibits his improved cooking pots and saucepans, which have marked advantages over the old Warren cooking utensils. These utensils, however, have been fully described on previous occasions: all who study economy in cooking, or desire the best results, should avail themselves of them.

Those persons who are interested in the efforts of the Smoke Abatement Institution to minimise smoke from coal fires should make themselves acquainted with the kitchen range shown by Mr. Henry Thompson, 33 Alwyne Road, Canonbury (1,551). This exhibit is not tabulated in the first catalogue, as it has been admitted since the opening of the Exhibition; its claims as a smoke consumer having been the cause of its admission. Attention has so often been called to the efforts of the inventor in minimising the production of smoke that there is no further necessity to dilate on them. Mr. Thompson is not connected, as a manufacturer of stoves and ranges, with the trade; but has given his constant attention to the subjects of the economisation of fuel and diminution of smoke for some years. At the Smoke Abatement Exhibition he exhibited an invention, then in a somewhat crude form, but possessing good points. At the Healtheries last year he showed a sitting-room grate and a kitchen range, going still further in the right direction, for which he was awarded a gold medal, the only award for prevention of smoke; and so recently as already mentioned, as to secure admission after the Exhibition was opened, he has perfected the nearest approach to a smokeless fire that can at present be obtained in an open fire grate, unaccompanied by mechanism of any kind. A grate to be smokeless, or approaching to that ideal, must be made so without leaving anything to chance or inattention to its mechanism on the part of the user; in other words, it must be perfectly automatic in its action. Mr. Thompson has done wisely to introduce his improvements in the first place in a kitchen range, for every householder knows that it is in the kitchen

that the greatest amount of smoke is generated. Unfortunately, the inventor has not been able to secure a place in the Exhibition where he can show the range in action, which is very much against his interests, but addresses to any reasonable extent can be given where these ranges are in operation, and where they can be seen under the most reliable conditions. Before long, however, a depôt will be opened in London where the kitcheners will be in action, and sitting-room grates at moderate prices will shortly be ready, made on the same principle. The illustration shows the kitchen range in elevation; it does not differ in appearance from those of the ordinary kind, neither is there anything in its manipulation beyond what is required in the commonest cooking stove; in fact, there is less care required, and no servant can make any mistake in using it. The coal is put on in the usual manner, and nothing more is required than to keep the fire alight. The reduction and almost non-creation of smoke is effected in the following manner:—In the fire-box are

time in watching its action. Presuming that a moderate amount of smoke at least would be visible when the fire was fed, the fire-box was filled to repletion with a highly bituminous coal, but he was surprised to find on immediately proceeding to watch the chimney-pot (one of the ordinary description) that but the merest discoloration possible was visible, while the surrounding chimnies were giving off their full complement of smoke, and the feeding was repeated during his visit with like results. The effect on the hot water arrangements of this house was all that could be desired, the water in the bathroom coming in at a higher temperature than usual. Another advantage in this range is that it presents a good open roasting fire, and that the ovens are always hot. It has been shown that the heat must always pass around them, as it is the only access to the flue. It must be evident that chimney-sweeping is reduced to a minimum whenever this stove is used. The cook will also be pleased to find that there is only one damper requiring attention in place of three in



laid hollow oblong-shaped bars extending from the top of the back downwards, and so on to the front of the range at the bottom. These leave a small chamber at the back, but are open to the ashpit underneath. At a certain distance from the top the bars are perforated at the back. The air entering at the front of them becomes highly heated, the bars being always in contact with the live coals, and this heated air is given off in the chamber at the back. The products of combustion are bound to pass through the interstices of the bars to this chamber, where they come in contact with the heated air, and are turned into flame, the combustion being complete. The mass then passes down to the right and left hand sides of the fire-box to a narrow channel, up which it travels over the top and entirely round the ovens on each side, passing into the ash-pit under the fire, which is necessarily highly heated, containing as it generally does red hot embers, and then passes into the flue at the back. Be it remembered that this is the only access to the chimney. The gases must pass this way, as it is the only outlet for them. That the mode is effective the writer can state authoritatively, having visited a house where one of them was in use, and spent a considerable

most other kitcheners. Any existing range, particularly those with back boilers, can be altered to Mr. Thompson's principle at a small expense, and many by well-known makers have been so treated and with successful results, according to testimonials in the possession of the inventor. The consumption of fuel appears to be reduced, which is easily accounted for by the whole of it being thoroughly burnt, instead of passing up the chimney unconsumed to pollute the atmosphere.

ELECTRICAL APPLIANCES.

Eastern Arcade.

Another mode of insulating telegraph and other electrical conductors is shown at 1,314 by Callender's Bitumen Telegraph and Waterproof Company, Limited, 101 Leadenhall Street, E.C. By this process the wires are first put in tubes and bedded in and covered with a bituminous compound. The tubes are then laid in rows in iron troughs, and filled up with the compound.

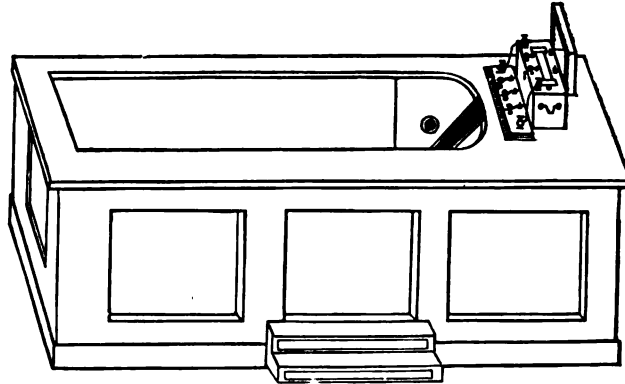
For the same purpose a patent box street-curb is shown at 1,354 by Mr. Wm. Riddall, 10 South Street, Finsbury.

which presents a very easy mode of reaching the wires, the lid of the box, which forms a curb to the pavement, only having to be unscrewed and taken off.

Another arrangement (1,412) is shown by Stuart & Co., Thomas Street, Edinburgh, consisting of a granolithic pavement with conduits of the same material formed underneath. This also forms a ready means of reaching the wires, the removal of a continuous line of slabs directly over the conduit laying the entire range open for inspection.

An important advance in the electric bath is shown (1,363) by Mr. Moses Humm, 727 Commercial Road, E., the novelty being so pronounced that (as the bath is not in action) many electricians are sceptical of the ability of the inventor to carry out what he promises. Desiring before speaking of the invention to test the accuracy of all that is advanced, the writer visited the inventor's establishment, where a number of electric baths on his principle are fitted up, and where he availed himself of Mr. Humm's desire that he would test their efficiency. Mr. Humm is an electrician of many years' standing, and has been experimenting for a long time on the invention now shown, and he has valuable testimonials

a body made of brass *repoussé* work, but others, with china and glass bodies in every variety of design, are in course of manufacture. The Messrs. Rose have been engaged for a long time in perfecting this lamp, and have reduced domestic electric lighting to the simplest form, a fact of which any person who will spend a few minutes at their stand can easily convince himself. To pour a liquid resembling mineral oil in appearance, but without its smell, into a lamp, and the next moment, by the mere turning of a knob, to obtain an incandescent electric light as powerful as that of a duplex lamp, and that will last as long without attention, without smoke, smell, or heat, is a consummation now within the reach of all purchasers of Messrs. Rose's lamps. There are no wires running along or under the table, nor anything to interfere with its free removal to any part of the room. This is not only electricity made easy, but certain in action, and an advance in the science few had hoped for in so short a time. This lamp, however, is the only one in the Exhibition of its kind. Briefly, without entering into the minutiae of its construction; the lamp is made to hold a container divided into two parts, in which the solution that produces



from persons of all ages and both sexes who have taken his baths. The arrangements of the electrical apparatus serving the bath are of his own invention, and differ considerably from those generally employed. An illustration of the bath is appended, with the battery attached at the head. It is built of marble, has a conductor running from top of the head to bottom, and a perforated marble bottom. On entering the bath the electric current is turned on, which can be regulated to the greatest nicety. The current enters the water direct, passes through the body its entire length, through the apertures in the marble bottom, and returns to the battery, where the circuit becomes complete. There is no holding of bars, as in the usual electric bath, or anything different to taking a bath under ordinary circumstances, yet such is its effect that a Turkish bath would not have more effect upon the system as regards its cleansing properties, and if it be contrasted with its Turkish analogue as a means of alleviating pain, or even of curing certain complaints, it must be pronounced far in advance of it. To this the writer can bear testimony of a reliable nature. This is the first electric bath of its peculiar construction, and it is much to be regretted that the arrangements at the Exhibition preclude its being shown in action. The arrangements for imparting the electric current are under complete control, they are of the most simple character, and the apparatus is supplemented by several well-contrived appliances for local application.

Messrs. A. V. & G. F. Rose, Ellerslie, Cavendish Road, Brondesbury, N.W. (1,341), exhibit a novel and meritorious invention in the form of a self-contained Electric Table Lamp, which differs scarcely in appearance from an ordinary oil lamp. The one shown has

the current is placed. The liquid is then poured in, and by means of a regulating screw on either side of the body the strips of metal that connect the elements forming the battery with the bulb are raised or lowered, and this produces the light, which can be turned on or off at will by means of a small switch of the usual character. If a less powerful light is required, one side only of the container may be used, the alteration being effected by disconnecting the other by means of the set screw.



Our drawing depicts the lamp in elevation; any kind of ornamental shade may be used with it. It is unnecessary

dilate upon the advantages of the electric light for c purposes, or the great advantages of this lamp others, further than to draw attention to the com- derived from its use on hot summer nights, or in nd tropical climates. The cost of burning is very ore than that of a duplex mineral oil lamp, while t is much purer and more brilliant. The lamp rtly be on view at Messrs. W. P. & G. Phillips's, ford Street, as well as at the principal lamp shops out the country.

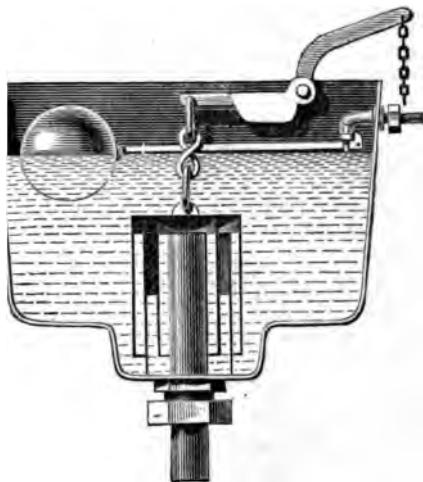
372, Mr. H. W. Ferris, 9 Dorset Road, Merton, exhibits a portable electric alarm attached to the portion of a door-mat. By this means any person upon the mat sets the electric current in motion gs the bell. It offers a security at any time of the night in a similar manner as an electric alarm l to a window.

rs. J. W. Gray & Son, 115 Leadenhall Street, E.C. exhibit their patent system of lightning conductors ruments for testing.

S. Waters, 24 Ladbroke Square, W., shows a on of bulbs for incandescent lamps, one half of each ilvered to form a reflector. By this means the m an incandescent lamp is increased, or the electric may be economised.

SANITARY APPLIANCES.

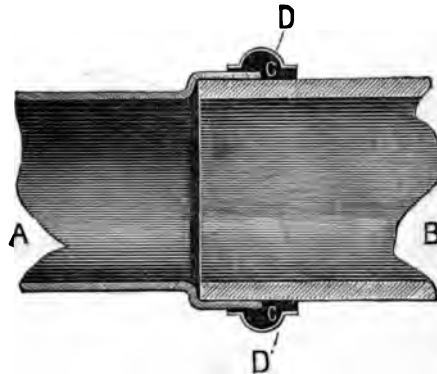
rs. Humpherson & Co., 331 King's Road, Chelsea, 222), South Gallery, North Court, exhibit two appliances that deserve attention. The first is a vaste Preventing Cistern, on the syphon principle, ed below. The regulations of the Exhibition pre- the admission of closets prevent the firm from ng the cistern to the best advantage, and from ; an excellent closet of their invention. Notwith- the many water-waste preventers on the syphon e now before the public, Messrs. Humpherson cceeded in introducing a valuable improvement in onstruction. By the addition of a well at the of the cistern, the full flush of two gallons is , which is not the case with the flat-bottomed . It would unquestionably be a great gain from a point if the water companies could be induced to the regulation allowances of water from two to two half or three gallons. It is undeniable that



ons is not sufficient to produce a 'clean' flush to osets, and the writer has found in most of the the Midland and Northern districts visited by t the larger quantity named is generally allowed. f the towns in question cannot boast of so good a of water as the metropolis, yet the authorities see ssity of the increased quantity for flushing. It will be

observed that Messrs. Humpherson's cistern is worked with a ball valve, which is the only mechanism in it, and the union connecting it with the discharge-pipe is outside. It has a full $1\frac{1}{2}$ inch water-way in every part, which secures a powerful flush to the last, and it acts effectually whether the lever is held the whole time or not. Owing mainly to the full water-way, it is especially useful in places where only a low head of water can be obtained, flushing well at a height of only two feet. The syphon chambers are three in number, instead of two, as in most others, the inner one being of strong galvanised iron, and the outer ones of copper. This arrangement causes the air to become more securely bound between the cylinders in the following manner:—A small quantity of water being retained in the well after the cistern has been emptied, when the water again enters the cistern, the air, as we have observed, becomes bound, thus preventing the water from passing over the inner cylinder. When the lever is raised, a partial vacuum is formed, and the water is forced into it by the pressure of the atmosphere, causing it to overflow the centre pipe, when the contents are discharged by the syphon action. Another advantage is that the lever cannot be drawn down too low so as to interfere with its return to its proper position, and the inlet of water is practically noiseless.

The other invention shown is also a patented one of Mr. Humpherson's introduction, and will be found invaluable under many conditions. It consists of an improved pipe-joint, useful for many purposes, but more particularly for the object the inventor had in view, viz., the making of a sound, or hermetically sealed joint between an earthen-ware trap and a metal soil-pipe, which has always been a troublesome matter, and often not a reliable one for any length of time. The appended illustration



A. Metal Pipe socketed to receive earthenware.
B. Earthenware Trap or Pipe.
C. Rebated Rubber Ring.
D. Metal Ring fitted with Screw for adjustment.



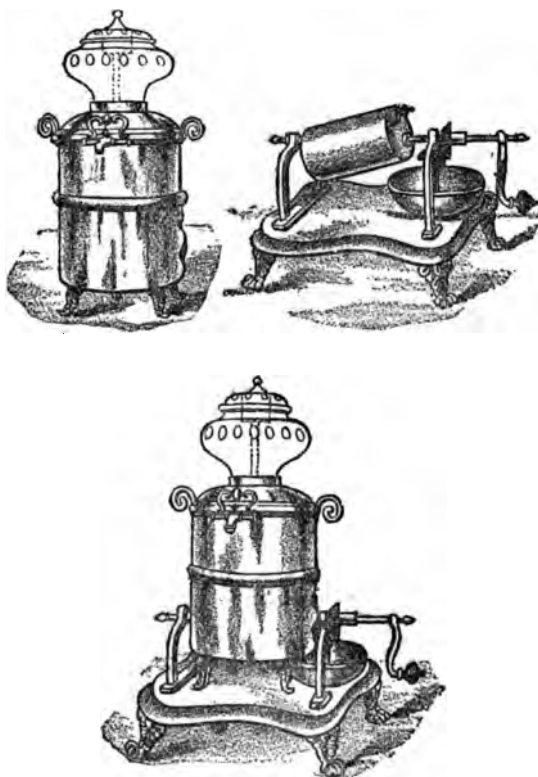
will enable our readers to fully understand the in- vention. It consists of a grooved metallic ring, into which is fitted an India-rubber rebated ring, which

slips over the junction of the pipes. By means of the screw and nut the metal ring is drawn together and the rubber expanded. A perfect joint is thus secured, capable of resisting any amount of pressure, caused by expansion, and comporting itself as readily to contraction, in fact accommodating itself to all variations of temperature. The rubber being vulcanised is calculated to last a number of years, and it will be seen how very easy it is to substitute a new ring. The utility of this invention is apparent, and will doubtless secure its adoption for many purposes where the thorough junction of pipes is a desideratum.

DOMESTIC APPLIANCES.

East Annex.

The Arabian Coffee Company, 42 Basinghall Street, E.C. (1,560), attract a considerable amount of attention to their unique process of roasting, grinding, and making coffee by one combined apparatus. These various processes are accomplished with ease, and may be carried out by any person after having once been shown, while the compactness of the apparatus is not among the least of its notable features. These appliances, which are illustrated below, are made in different sizes for domestic use, and on a large scale for coffee-palaces, clubs, and large institutions. In those for domestic use a flat box-shaped spirit lamp supplies the heat, or gas may be utilised. The illustrations represent the apparatus in a combined form, the stand containing the roaster and the coffee-mill, the receptacle for holding the coffee being underneath the stand, and the coffee-urn, as it stands on the table after it has been removed from the stand. The coffee-roaster, it



will be seen, is fitted on the eccentric principle, so that with each rotation of the cylinder the berries are not only always being agitated, but they are thrown from one end of the cylinder to the other by the eccentric motion, so that every one is constantly being turned over, or in a

state of change. The coffee having been put in the cylinder by means of a sliding door at one end, water is put into the coffee-urn by simply removing the glass lid at the top, and the urn placed on the stand covering the coffee-roaster, as shown in the accompanying illustration.

The spirit lamp is now placed under the coffee roaster, and the operator turns the handle of the roaster slowly, the heat that supplies the roaster is at the same time boiling the water in the coffee urn. In about five minutes the coffee is roasted. Until the introduction of this apparatus there has not been any appliance for effecting the operation so rapidly, and without loss of the fragrant aroma given off by the berry. As to the economy of the apparatus, if it be taken into consideration that roasting, grinding, and making is accomplished within about twelve minutes, it will be clear that the apparatus is a very valuable one. The best results the berry is capable of giving are also secured, consequently a much smaller quantity of coffee than is generally used is required to produce a finer flavoured beverage with all the valuable constituents of the berry should this machine be adopted. An ounce of plantation coffee, costing in its green state less than one penny, made in an ordinary sized machine, produces much stronger coffee than the great majority of people would care to drink, and it is stated that the finest flavoured infusion may be obtained by using this apparatus with less than half the quantity usually used. It is therefore an apparatus that may be employed in public institutions with economy, and produces a better and more wholesome beverage than is made by the usual method. The prices are moderate; a fair sized apparatus for domestic use, the urn being of brass and tinned inside, can be sold complete with all the *et-ceteras* for two guineas.

Mr. J. Coppard, 35 Holloway Road, N., shows a good collection of sausage and mincing machines, an improved folding and self-tilting cask stand, and several useful domestic requisites.

At 1,567, Messrs. W. and J. Burrow, 15 Seething Lane, E.C., exhibit their well arranged wine-bins, wine-stills, &c., and a variety of articles connected with the brewing and wine trade.

Mr. James G. Moxon, 24 Grand Avenue, Leadenhall Market, E.C. (1,371), has an ingenious letter-box and door-plate, intended to be used in connection with an electric bell, or an ordinary small gong. On raising a handle the letter-box plate is opened for the insertion of the letter and the bell rings, calling attention to the arrival. The box, which has a division in the centre connected with the handle and plate, admits the letter to the first compartment, but when the handle is released the division plate opens to allow the letter to fall into the lower compartment, and closes again, thus preventing any tampering with the letter-box, for an attempt to do so will cause the bell to ring again. The invention is ingenious and a safeguard, besides calling the attention of the inmates of the house to the fact that something has been put in the letter-box.

Messrs. Malen et Dégies, Paris, through their English agents, E. Salaman & Co., 3 Cross Lane, Eastcheap, E.C. (1,582), show a collection of their apparatus for making coffee, from the small size holding only two cups to the monster machine as used in the French Army and Navy and large institutions abroad, capable of making at one time 2,400 cups of coffee. The large sizes are heated by gas, charcoal, or coal fuel, the smaller ones for the table by means of a spirit lamp. We append a sectional illustration of the machine; the coffee is placed on a perforated plate in the upper part of the vessel, the water being in the lower compartment. When, by means of the spirit lamp at the bottom of the apparatus, the water boils, it is forced up the central tube, and, with the assistance of a mushroom-shaped plate, is spread over the coffee in small streams, passing through it to the lower reservoir, and this action continues as long as the lamp is kept alight, so that there is a continual or

culatation of water through the coffee. The action, it will be seen, is also automatic, and may be performed on the breakfast table. It is claimed that a large saving of coffee

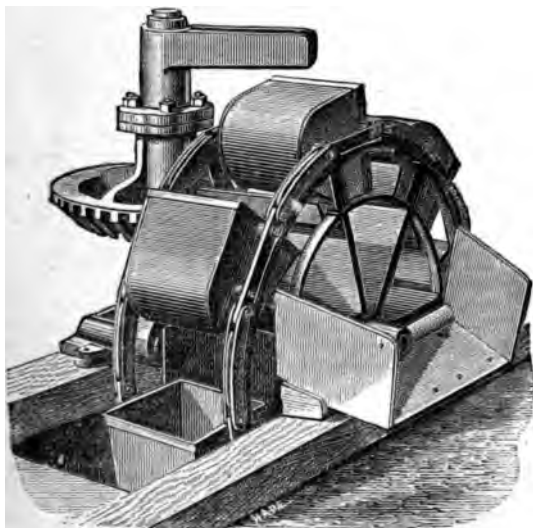


is effected by this machine, for it is urged that water passing only once through the coffee, as in most filtering coffee-pots, is not capable of extracting all the strength in the berry. In the large sizes of this apparatus, owing to the interior construction, a great economy in fuel is also secured. When the coffee is made, the central tube may be withdrawn by means of the lever shown at the side.

MECHANICAL APPLIANCES.

(South Gallery.)

Messrs. W. J. & C. T. Burgess, Holborn Viaduct and Brentwood (16) exhibit their improved water-lift or Noria, intended to be used with the aid of bullocks, horses, or mules, of which an illustration is appended. They are made in several sizes, capable of raising from 3,000 to 18,000 gallons per hour. Though adapted for general farm use at home, they are more extensively used in India, Egypt, and the Colonies. They are very simple in con-



struction, and equally efficient, and raise more water for the power employed than any other form of pump. They are arranged to raise water from great depths, and, no fixing being required, can be moved from place to place at a trifling

cost. It will be observed by the illustration that the raising is effected by an endless series of buckets, each discharging its contents as it passes the equilibrium, and the chains holding the buckets are adjusted to the depth of water. They can be 'speeded' according to the motive power to be employed, and the apparatus can be easily taken to pieces, and the weight so adjusted that no one, or collection of parts is rendered too heavy for beasts of burden to carry. A modification of this appliance is made for hand-power work, and will be found most advantageous for home use, raising a considerably greater quantity than can be done by the ordinary means.

NUISANCE FROM BRICK-BURNING.—Two important cases dealing with the nuisance arising from brick-burning have recently been decided by the High Court of Justice. In both cases the plaintiffs succeeded in proving nuisance, and two judges granted injunctions restraining the defendants from carrying on their businesses so as to create a nuisance. In a case from Streatham (*Dunston v. Neal and Seely v. Neal*) the plaintiffs complained that the noxious smells arising from the brickfield seriously interfered with them in the enjoyment of their premises—so much so that in certain states of the wind (although they lived about 400 and 800 yards, respectively, distant from the source of nuisance), they were unable to open their windows. The cause of nuisance arose from the use of dustbin refuse in the manufacture and in the burning of bricks, the effect being to produce noxious fumes, which gave rise to nausea, loss of appetite, headache, and malaise. Some witnesses said they had traced the smell at a distance of a mile. The quantity of bricks made averaged 2,000,000 yearly, and the materials used were 500 yards of refuse, 500 yards of road scrapings, and 5,000 yards of clay. Mr. Justice Cave, in delivering judgment in favour of the plaintiffs, said the plaintiffs had to make out that there was a nuisance which substantially affected themselves in health, or in the comfort and enjoyment of their premises. The evidence satisfied him that so far as the brick-burning went there was no nuisance to health in the sense of causing disease or illness. There remained the question whether there was a nuisance which affected the plaintiffs in the comfort and enjoyment of their premises, but he should first inquire whether there was a nuisance which affected anybody. In face of the medical evidence given for the plaintiffs, he could not believe that the use of refuse of an organic nature (animal and vegetable), in brickmaking, did not create a nuisance to the neighbourhood. On the whole the evidence for the plaintiffs very much preponderated, and his lordship was clearly of opinion that there was a nuisance at the brickfield. He was satisfied that this was a nuisance which could be perceived at the plaintiffs' premises, and to such an extent as to render the occupation of their houses uncomfortable and unenjoyable. His lordship, therefore, directed judgment for the plaintiffs, with an injunction to restrain the burning of bricks in such a way as to interfere with the comfort of the plaintiffs. In a case from Hampstead (*Attorney-General v. Ellt*), Mr. Justice Wills, at the request of the defendants, consented to view the brickfield, which lies in a hollow near the Hampstead Heath Railway Station, and adjoins the grounds of the North-Western Infectious Hospital. Upon coming into court, when the case was resumed, his lordship said he found a nuisance to exist, and with the consent of the defendants he stopped the case, delivering judgment in favour of the plaintiff, with costs.

THE Council of the Society of Arts have (with the approval of the President (H.R.H. the Prince of Wales) awarded the Albert Medal to Mr. Henry Doulton, 'in recognition of the impulse given by him to artistic pottery in this country.' It will be universally acknowledged that never has such a recognition been better deserved nor more honestly earned.

MUNICIPAL FINANCE.

LOCAL TAXATION.

SOME interesting and instructive figures are given in a memorial recently presented to the Liverpool City Council by a local Land and House Owners' Association. The figures were originally intended as support to a prayer that some effort should be made to reduce local taxation.

The memorialists give a comparative statement of the taxation of Liverpool and Glasgow which, if accurate, affords food for reflection:—

	Liverpool.	Glasgow.
Area in square miles	8	8
Population	566,753	515,589
Rateable value	£3,093,507	£3,072,551
Raised in rates	£486,202	£358,178
Per head	17s. 2d.	13s. 10½d.
In the pound	2s. 12d.	2s. 4d.
Other revenues	£115,823	£51,171
Per head	4s. 1d.	1s. 11½d.
In the pound	9d.	4d.
Total expenditure	£602,115	£409,349
Per head	£1 1s. 2d.	15s. 10½d.
In the pound	3s. 10½d.	2s. 8d.
Total debt	£5,794,757	£4,564,019
Per head	£10 4s. 5d.	£8 17s. 0d.

The following statistics given are of course open to the criticism that the citizen gets much more for his rates nowadays than he did in 1851, as in many departments of present municipal activity, even at the earlier date, matter for private arrangement did not exist at all. But such as they are they show the rapidity

with which the financial burdens of our large towns are growing:—

	Rateable Value.		Increase of R. V. per cent.	Increase of Rate per cent.
	1851.	1884.		
Parish	£	£	P.c.	P.c.
Kirkdale	1,076,514	1,918,541	78	171
Everton	29,640	273,681	823	137
West Derby	86,276	303,981	252	115
Toxteth	79,580	227,471	183	93
	183,653	385,838	111	137

The figures as to the amounts received from rates in the years 1851, 1861, 1871, and 1883 are remarkable:—

Rate.	1851.	1861.	1871.	1883.
Water	£4,510	£12,012	£53,502	£69,032
Paving	28,691	56,970	47,780	60,735
Sewer	7,665	25,725	23,168	53,625
General	14,977	21,114	56,171	121,072
Lighting	16,222	16,222	16,547	50,646
Watch	13,034	12,200	12,759	14,095
Museum	—	1,300	9,369	12,762
Improvement ..	—	5,778	55,878	64,947
Parks	—	—	26,954	38,474
Total	£68,878	£151,321	£302,218	£486,251

It is much to be wished that the local burdens of all our large cities could be analysed and compared in the same way. We are afraid that the expenditure of many corporations is wasteful and extravagant.

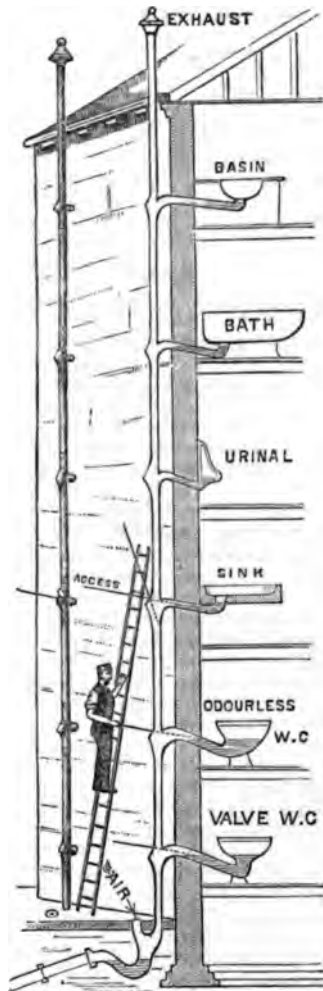
Name of Stock.	Amount of Stock in Circulation.	Interest.	Dates of Interest Payments.	When Redeemable.	Highest and Lowest Prices				Closing Quotations June 11.
					During 1884.		Jan. 1 to June 12, 1885.		
					Highest.	Lowest.	Highest.	Lowest.	
*Metropolitan 3½ p.c. Stock ..	16,984,326	P.c.	6th Jan., April, July, Oct..	6th Oct., 1920..	113	104½	108½	101	107 — 101
" " 3 p.c. " ..	7,259,000	3	1st Feb., May, Aug., Nov..	1st Feb., 1941..	103½	96½	100½	94	98½ — 99½
Birmingham Corporation Stock	3,445,693	3½	1st Jan., 1st July	On or after May 17, 1946..	104½	99½	101½	98½	99½ — 100½
Blackburn Corp. 4 p.c. Stock ..	330,290	4	1st Jan., 1st July	Irredeemable ..	—	—	—	—	110 — 111
Bradford Corp. 4 p.c. Stock ..	647,900	3½	1st Jan., 1st July	Irredeemable ..	98	96	—	—	98 — 98½
" " 4½ p.c. " ..	1,568,437	4½	1st April, 1st Oct.	Various	—	—	—	—	110 — 110½
" " 3½ p.c. " ..	507,502	3½		Various	—	—	—	—	114 — 115
" " 3 p.c. " ..	272,745	3		Various	—	—	—	—	—
" " 16,663	3½	—		Various	—	—	—	—	—
Bristol Corp. Debenture Stock	1,209,380	3½	1st May, 1st Nov.	Perpetual	102	97½	99½	97	98 — 99
*Croydon Corp. Stock	400,000	3½	5th Jan., 5th July	Within 40 years.	99½	97½	100	96	97 — 98
Dundee Corp. Stocks	503,002	3½	15th May, 11th Nov.	Purchased	—	—	—	—	—
Glasgow Corp. Red. Stock	500,000	3½	15th May, 11th Nov.	15th May, 1914..	102	99½	100	98½	99 — 100
Huddersfield Corp. Stock	250,000	3½	1st Jan., 1st July	1st July, 1934 ..	101½	96½	100	99	98 — 98½
*Hull Corp. Stock	500,000	3½	1st Jan., 1st July	1943	103½	100	—	—	—
Lee Conservancy Deb. Stock ..	196,417	4	1st Jan., 1st July	Perpetual	103½	100	—	—	—
Leeds Corp. Cons. Deb. Stock ..	2,389,630	4	1st Jan., 1st July	1st July, 1927 ..	112½	108	111	109½	110½ — 111½
" " 3½ p.c. " ..	558,720	3½		{ Any time on 6 months' notice.	102½	98½	101½	99½	101 — 102
Leicester Corp. Gas and Water Deb. Stock	628,153	4	1st Jan., 1st July	31st Dec., 1934..	—	—	—	—	—
Leicester Redeemable Stock ..	280,553	3½	1st Jan., 1st July	Purchased	105½	98½	102	93½	100½ — 101½
*Liverpool Corp. Stock	6,000,000	3½	1st Jan., April, July, Oct..	1st July, 1932 ..	98½	98½	—	—	98 — 99
Longton Corp. Stock	107,000	3½	1st Jan., 1st July	Irredeemable ..	119½	111½	115	114	112½ — 113½
Manchester Corp. 4 p.c. Stock ..	3,775,735	4	24th June, 24th Dec.	Irredeemable ..	—	—	—	—	98 — 100
" " 2½ p.c. " ..	91,035	3½	24th June, 24th Dec.	Irredeemable ..	—	—	—	—	—
Middlesbrough Corp. Red. Deb. Stock	300,000	3½	1st Jan., 1st July	1st Jan., 1909 ..	—	—	—	—	99 — 101
Newcastle Corp. Stock	450,000	3½	1st Jan., 1st July	1st July, 1916 ..	101	100	100½	100	98½ — 99½
*Nottingham Corp. Stock	2,000,000	3	1st May, 1st Nov.	Irredeemable ..	86½	82½	84½	80½	83½ — 84½
Oldham Corp. Deb. Stock	423,047	4	1st Jan., 1st July	Irredeemable ..	—	—	—	—	110 — 111
†Portsmouth Corp. Stock	400,000	3½	1st Jan., 1st July	1st Jan., 1924 ..	101	97½	99½	98½	97½ — 98½
Reading Corp. Stock	500,000	3½	1st April, 1st Oct.	Irredeemable ..	101	95½	100½	97½	99 — 100
Rotherham Corp. Stock	253,188	4	25th March, 25th Sept.	1927	—	—	—	—	103 — 104
Sheffield Corp. Stock	108,150	3½	1st March, 1st Sept.	1914-34	—	—	—	—	99½ — 100
*Swansea Corp. Stock	600,000	3½	1st Jan., 1st July	18th July, 1951..	59	94	98½	95½	96½ — 97½
Wigan Corp. Stocks	336,940	Var.	1st Jan., 1st July	60 years	—	—	—	—	—
Wolverhampton Corp. Stock ..	600,000	3½	1st March, 1st Sept.	1932 and 1942 ..	99	94½	98½	95½	97½ — 98½

NOTE.—The Stocks marked with an asterisk (*) are transferable in books kept at the Bank of England; those marked with a dagger (†) at other London Banks. The rest are transferable by deed in the usual way, and the Agents are officials of the several Corporations.

NEW INVENTIONS.

HAGEN'S PATENTS.—IMPROVEMENTS IN
STEAM- AND SOIL-PIPES, AND THE ODOUR-
LESS WATER-CLOSET.

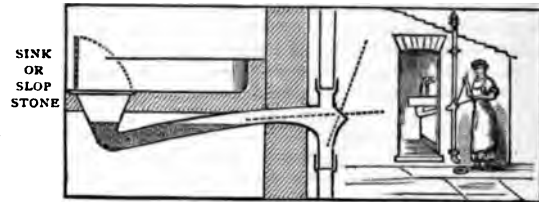
the disconnection of soil- and waste-pipes from the main drains and sewers, sanitary engineers have succeeded in excluding sewer gas from dwellings; but to all intents with the state of waste- and soil-pipes now in use, it will be only too apparent that a large amount of air, arising from the orifices of various receptacles for water, still emanates even where special attention is directed to the thorough cleansing of the fittings or appliances themselves. This is owing in a great measure



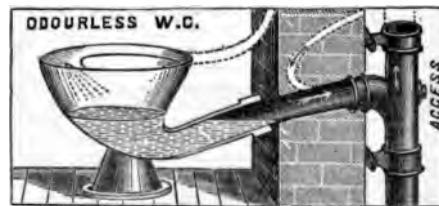
the invariable practice of fixing the branch waste- or soil-pipe with direct fall from the fitting to the main soil-pipe; and though a syphon trap be placed at or near the junction of the waste-pipe, this will not always insure the complete exclusion of soil-pipe air, for they are not infrequently unsealed by syphonage and evaporation, and then there is a clear inlet for foul air through a length of fouled pipe. Even when this does not occur, the water of the trap becomes impregnated with the emanations from the soil-coated pipes rising and accumulating at the top of the trap where the water-seal is fixed. Again, these traps

are fixed a foot or more below the orifice of fitting; this in itself admits of the fouled surface of pipe being a source of contamination. It is well known that any amount of water flushing will never remove the slimy and corroded lining from the inside of foul pipes, and yet these things are allowed to exist in some of the largest houses. By an improved arrangement which has been patented by Mr. F. W. Hagen, of 16 Parliament Street, Hull, the branch waste- and soil-pipes are made thoroughly self-ventilating, and accessible from the outside of dwelling. They are as efficient as they are simple, as will be seen from the following description, and have already been severely tested in numerous places where they have been fixed during the last twelve months, and found thoroughly efficient. Messrs. Reeves & Hagen state that there are already over sixty in use in connection with w.c.'s, baths, sinks, and basins.

The following is a description of the invention, illustrated below:—From within two inches of the surface of the bottom of the slop receptacle—be it bath, basin, sink, &c.—the branch-waste is made to rise either in a straight or curved line direct through the external wall, towards the vertical or main soil-pipe or waste, which latter should be ventilated at both ends. The advantage gained by this arrangement is that whilst the water has to travel as it were upwards in its course towards the main pipe, yet at an easier gradient than an ordinary S trap, any noxious vapour generated in the pipes is allowed to follow its own



bent and will be induced to rise outwards away from the water-seal, and up the ventilating pipe. At the junction of the branch with the vertical or main pipe and opposite the end of the branch-waste, a gullet-formed opening is provided, which gives direct access the entire length of the waste- and main-pipe, and is covered with a close-fitting hinged flap or screw cap. At the receptacle end of the branch waste-pipe the level of the water-seal is within an inch of the surface of the bottom of receptacle, and is sealed with a 2 in. dip, which prevents any possibility of effluvia forcing its way through, with a clear way over it up through the main ventilating pipe with exhaust cowl on the top. For water-closets the branch soil-pipe dips 2 in. into the water-seal of the basin, the top of the branch rising longitudinally towards the main soil-pipe. It is made without solder or seam, within the building, and being dipped into the water-seal of the basin at the receptacle end no escape of soil-pipe air can possibly enter the



building, as it will be drawn upwards and be carried off by the ventilating pipe without. An additional advantage is that the arrangement is less expensive than the old method, requiring shorter lengths of branch pipes, and several can be branched on to the main soil-pipe without the slightest risk.

Messrs. Reeves & Hagen have also patented an Odourless W.C., which appears to meet with general satisfaction.

As shown in the sketch, the branch soil-pipe in this invention enters the outlet arm and dips into the water-seal, so that soil-pipe air cannot possibly escape internally. The appliance is fitted on the finished floor of the apartment with a connection as shown direct through the outer wall. When fixed, an arm-chair seat is placed in position, which is loose and movable at any time, though sufficiently firm to resist unintentional disturbance.

The basin is made shallow so to induce hand-cleansing with a cloth, so necessary to keep a basin wholesome; and at the bottom, in bold letters, 'Cleanse to this line twice a week' is stamped on each basin, while at the side of the elbow of chair an enamelled label is fixed, with the following:—'Cleanliness the Handmaid of Health.'

INVENTION OF A NEW PAN-WAGGON.

THERE has recently been patented, by Mr. W. Barton, of Wolverhampton, a new sanitary van, or pan-waggon, which is claimed to possess advantages over those now in use, and which has recommended itself to those who have seen it on this account. The van is built in sections, each of which is perfectly water-tight, being constructed of galvanised iron. Only two pans are exposed at one time, while the men are changing them, and they are inclosed by self-adjusting doors, which close hermetically, rendering it impossible for any odour to escape. Even though composed of iron, the van is lighter in weight than the wooden ones now in use by the Wolverhampton Corporation, and is very little, if any, more expensive. By the use of this van it is considered that the work can be done in the day-time without public inconvenience. Even should the excreta leak from the pans, or overflow in the waggon, it would not affect the exterior, as it would be caught in the bottom of the van and discharged by means of a plug-hole at the depot. The van has been highly approved of by the Corporation of Wolverhampton.

A RUSSIAN HYGIENIC MACHINE.

IN the Russian Court at the Inventions Exhibition, under Group III., is to be seen an ingenious contrivance, patented by Dr. K. Proussak. It consists of a wooden seat, with an ordinary dished hole and hinged flap, adaptable to a common privy. The flap, which opens sideways, is raised or lowered by means of a cast-iron handle fixed to its outer edge. The two sketch diagrams below respectively show the apparatus in section when closed, and when opened for use. When opened, as seen in fig. 1, a

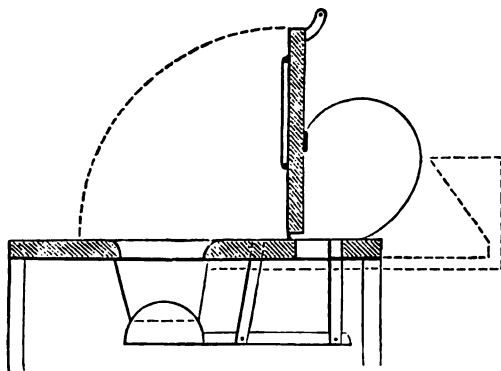


FIG. 1.

strong steel spring attached to the upper side of the flap forces down an arm, which acts upon a lever, to which is attached a hollow hemisphere of zinc or other metal. This hemisphere fits tightly into the lower end of the open metal pan which serves as a basin, thus preventing any cold up-draught.

To the under side of the flap is fixed an India-rubber ring, which, on the closing of the flap, becomes tightly compressed against the seat by the force of the spring acting from above, the object being to prevent foul gases from arising. When the apparatus is closed after use, as shown in fig. 2, the arm to which the spring is attached draws up

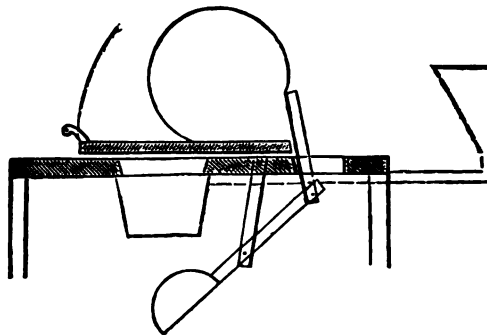


FIG. 2.

the end of the lever, thus releasing the hemisphere from under the pan, and allowing the contents to fall through.

The dotted lines on the right side of each diagram show a receiver and a pipe, by which water may be poured through the apparatus while the flap remains closed.

AUSTIN'S POROUS DISINFECTOR.

THIS useful invention has now passed into the hands of Messrs. Sharp & Co., the Sanitary and Ventilating Engineers, 4 Holborn Circus, E.C. It may be described as follows. 'A porous cell, hermetically sealed, and containing any crystal disinfectant (e.g. Pot. Permang.) is placed in the water-cistern supplying the closet. In a short time the action of the water on the porous cell (endosmosis) dissolves very gradually portions of the crystals nearest the circumference of the cell, and, on the principle of exosmosis, the water in which the "disinfector" is placed becomes impregnated with disinfectant, thus forming an efficient disinfecting fluid, which is always ready for use.'

Originally designed for the above and other allied uses, it is now proposed by Mr. Sampson Low, B.A., F.M.S. (with the full concurrence of the original patentee), to introduce the 'disinfector' in a slightly modified form, by which means it is rendered most suitable to the everyday requirements of medicine.

The 'disinfector' is now made, filled with any disinfectant or antiseptic crystals, in such a size (3 in. x 1 in.) that it can be easily carried about in a surgeon's instrument case. By merely dipping the 'disinfector' in water an efficient disinfecting fluid can readily be obtained.

It is a most convenient method of practising antiseptics, and no hospital-ward should be without its 'disinfector.' It is, moreover, very economical; one 'disinfector' lasts a year, allowing for daily usage, and costs but half-a-crown. The appliance can be seen in action at the establishment of Messrs. Sharp & Co., 4 Holborn Circus, London, E.C.

A CONSIDERABLE DIFFERENCE OF OPINION.—At the last meeting of the Northallerton Rural Sanitary Authority, it was proposed to appoint Mr. Lumley as Medical Officer of Health at £40 per annum instead of £60; but a letter from the Local Government Board was read, stating that that amount would not be a fair remuneration for the 'efficient discharge of his important duties,' upon which the Clerk was instructed to write, in answer, and state that the Authority was unanimously of opinion that £40 was 'ample to secure the proper discharge of the duties of the office.'

REVIEWS.

A BATCH OF TEXT-BOOKS ON PUBLIC HEALTH.

- (1) *The Law Relating to Local and Municipal Government*, comprising the Statutes relating to Public Health, Municipal Corporations, Highways, Burial, Gas and Water, Public Loans, Compulsory Taking of Lands, Tramways, Electric Lighting, Artisans' Dwellings, &c., Rivers' Pollution, the Clauses Consolidation Acts, and many others. By C. NORMAN BAZALGETTE, M.A., and GEORGE HUMPHREYS, B.A., Barristers-at-Law. Pp. 1762. Super-royal 8vo. London: Stevens & Sons, 119 Chancery Lane, W.C. 1885. Price 3/ 3s.
- (2) *The Public Health Act, 1875*. Annotated, with an Appendix containing the various Incorporated Statutes. By W. G. LUMLEY, Esq., LL.M., Q.C., and EDMUND LUMLEY, B.A. Second Edition, with very extensive additions, by WM. PATCHETT, Esq., Q.C., and ALEXANDER MACMORRAN, Esq., M.A. Pp. 1075. London: Shaw & Sons, Fetter Lane. Price 3/ 6s.
- (3) *The Laws Concerning Public Health*. Edited by WM. ROBERT SMITH, M.D., B.Sc., F.R.S. Edin. Pp. 812. London: Sampson Low, Marston, & Co.
- (4) *Handy Guide to Public Health*. By THOS. WHITE-SIDE HIME, B.A., M.B., Medical Officer of Health for the Borough of Sheffield. Pp. 207. London: Baillière, Tindal, & Cox.
- (5) *Sanitary Law: a Digest of the Sanitary Acts of England and Scotland*. By H. AUBREY HUSHAND, M.B., C.M. Pp. 240. Edinburgh: E. & S. Livingstone.

We are constantly being asked to advise as to the best text-book on the subject of public hygiene now in the market: intending purchasers being confused and distracted, as well they may be, by the perpetual flow of new text-books, and hand-books, and pocket-books, and summaries by a multitude of eminent hands. Our answer has been, and must be, that very much depends upon the purpose for which the book is needed. If for the elucidation of subtle points of law and learned speculations as to what was the intention of Parliament in using a particular form of words, then one of the text-books by sanitary lawyers must be employed; if a less formal exposition of the law be desired, then one of the summaries which have been prepared will be useful; if not only sanitary law but sanitary practice be sought for, then one of the standard manuals of hygiene must be acquired. But no one book that we can name contains a sufficient leaven of all these. Yet it must constantly happen that a sanitarian wants to know not only the canons of hygiene, but how these canons have been crystallised into law, and how the exact language of the law has been interpreted by the Courts of the realm. As has been well said, 'To hit the happy medium, to be neither too technical nor too slatternly, neither too sketchy nor too hair-splitting, should be the characteristics of the perfect handbook of sanitary law.' And this, it must be confessed, notwithstanding the imposing array of books at the head of this notice, has yet to be written.

It would be unfair to pit the books before us one against another, when their professed object is so very different. We may take it, however, that they are one and all designed for the enlightenment and instruction of their devotees. There are evidences in almost all of a sincere desire to be helpful, and we should hesitate to say of any one of them that there was any conscious padding. But in one case, at least, a little hardening of the editor's heart might have saved some pages of a swollen volume for the insertion of the indispensable but crowded-out index. The central figure of each book is, of course, the Public Health Act; but there is endless variety not only in the adornments with which it is bedecked, but in the supernumeraries which different stage-managers regard as necessary for its befitting exhibition.

To gauge the value or merit of books by their weight in pounds avoirdupois is, perhaps, hardly a scientific method of appraisement; and yet the temptation is irresistible to point to Messrs. Bazalgette and Humphreys' book (1) as the finished product of our wisdom in sanitary legislation. It transgresses by nearly two pounds the laws of the Postmaster-General as to the limit of weight for the parcels post; it contains nearly 1,800 closely-printed pages of super-royal octavo; and it reproduces some 150 statutes affecting local and municipal government. The heart of the boldest reviewer may fail within him as he essays to criticise this younger brother of the Post Office London Directory.

Mr. Lumley's successors, whose book (2) has a more restricted range, manage to escape with as few as eighty other Acts besides the principal Act. We are quit of the Public Health Act and its exposition by page 445; the remaining 630 pages are devoted to the 'appendix.' The wealth of material begets in Dr. Smith such despair that he forbears from criticism or exposition altogether, and uses up his 800 pages with a heterogeneous mass of Acts more or less connected with the public health, and with a motley crowd of circulars and model by-laws, not arranged in any way that is understandable, and provided with no key in the shape of an index. Such a book it is hopeless to criticise, except in the direction of pointing out its omissions or redundancies. The Scotch public health law—always a sealed book except to the elect—is insufficiently set forth by Dr. Smith; and the Artisans' Dwellings Act of 1868—perhaps the most important of the series of Dwellings Acts—is omitted, though those of 1875, 1879, and 1882 are printed in full. It is not easy to understand why the Contagious Diseases Acts should be set forth *in extenso*, whilst the Registration of Births and Deaths Act is held unworthy even of mention. On the whole, we are sorry not to be able to recommend Dr. Smith's book as a useful or a practical manual of ready reference.

The scheme of the two more important works (1 and 2) under consideration is essentially different. Messrs. Bazalgette and Humphreys aim at comprehending within two covers all the 'laws which urban and rural authorities and municipal corporations are called upon to administer.' Thus the Public Health Act, whilst holding the first place in their thoughts and in their pages, has to take its chance of annotation and exposition with the rest of the Acts. Messrs. Patchett and Macmorran, on the other hand, go much more into detail over the Act of 1875, and only garnish it, as it were, with the eighty odd other Acts which are more or less incorporated with it. Whilst, therefore, for greater convenience of review, we group the two books together, it must be understood that they are not really comparable, and that it would be unfair to say of either of them that it was better than the other. If the typography of No. 2 is clearer than that of No. 1 (the microscopic difference of type between the text and the notes of the latter is occasionally very confusing), the index of No. 1 is incomparably more complete and businesslike than that of No. 2. And, after all, by what is a man advantaged if he possess the most complete and accurate of works, and have not a sensibly compiled key to it?

Messrs. Bazalgette and Humphreys announce with a certain pride in their preface that they give 142 statutes and substantial parts of statutes. The table of contents accounts, indeed, for as many as 141, and there are at least three Acts—the Labouring Classes Dwelling Houses Act, 1867 (page 1,262), the Public Libraries Amendment Act, 1866 (page 723), and the Poor Law Act, 1879 (page 1,370)—which, though given in full in their proper places, have unaccountably slipped out of the table of contents. Other Acts there are, such as the Epidemic and other Diseases Prevention Act of 1883 and the Public Health (Fruit Pickers') Lodgings Act of 1882, which, though not considered worthy of mention either in the index or in the table of contents, may be found with a little research on pages 110 and 215. We would venture to suggest to the learned authors that students of this book may sometimes desire to refer to the text of a particular Act, a reference

to which they may come across in promiscuous reading, and that it would be worth while to give a definite and separate line in the index to Acts of this description, now effectually concealed from the vision of the ignorant. And in this connection it may be pointed out that Sect. 248 of the Public Health Act directs that the accounts of every rural sanitary authority shall be audited 'in the same manner' as the accounts of guardians are audited. Might it not have been well, in order to have completed the story, to have described in the book the manner in which such accounts are to be audited by printing some of the clauses of the Acts of 1844, 1848, 1849, and 1866 which relate to this question?

On the whole, we have no reason to quarrel with the statutes printed in the volume, except, perhaps, on the ground that the relation of some of them with local government is very remote. We have only discovered one Act—the Baths and Washhouses Act of 1882—which is actually omitted from the book, and which we could have desired to see included. It is true that this Act is a very short one; but it is as long as some of those deemed worthy of separate mention, and it makes an alteration of some importance in Sects 24 and 27 of the Baths and Washhouses Act of 1846, by giving power to local authorities to provide baths, &c., not only within the district, but also in the immediate neighbourhood thereof. The Contagious Diseases (Animals) Act of 1878 is really chiefly important for the Orders of Council made under it, and these, we think, might usefully have been printed. Probably the memorandum as to the sanitary requirements of cemeteries, promised on page 1,145, was crowded out at the end, but it is infinitely more to the purpose than the circular on the same subject which the authors find room to print on pages 1,552–54. The circular as to annual reports of medical officers of health, printed on page 1,486, is now out of date. It would have been well to print the regulations issued by the Local Government under Sect. 2 of the Canal Boats Act of 1877 (page 1,470). The preface promises 'the standing orders of the House of Parliament relating to local Bills and Provisional Orders,' and these might, if given properly, have proved, as hoped by the authors, of 'practical value.' But the only standing orders printed are those relating to provisional orders, and a stray clause as to reports by select committees. Supposing standing orders to claim a place in the book, it would be needful to give the classes into which Parliament divides local Bills, the advertisements in the local papers and in the *London Gazette* that are necessary before such Bills can be introduced, the notices and applications to owners and occupiers, the different dates for deposit of plans and copies of Bills, the Government departments to which plans and Bills are to be sent, and the other important requirements, neglect of any one of which may prove fatal to a Bill.

We have now exhausted the wormwood in our inkbottle, and are free to speak in terms of the highest praise for the really remarkable perseverance and patience with which Messrs. Bazalgette and Humphreys have gone through their 142 Acts, and have tried to make out of them an understandable code of sanitary law. We have dipped into their annotations in all sorts of places, and have usually found them accurate and helpful. In cases of doubt they are judiciously silent, where less cautious commentators commit themselves to questionable interpretations. We cannot complain of this, and, indeed, the scheme of the work puts out of the question any argumentative reference in detail to particular clauses. The special value of the book will probably prove to be its inclusion of all Acts which can conceivably affect local municipal administration, the careful cross-references which make up a large proportion of the notes, and the very complete and serviceable index. Faultless it could perhaps hardly be expected to be; the possibilities of error in a technical volume of 1,800 pages being amazing. The criticisms on which we have ventured have certainly been made from no lack of appreciation of the laborious and careful work which Messrs.

Bazalgette and Humphreys have bestowed upon the book, and the insignificant character of the blemishes pointed out may inferentially be taken as a tribute to the great merit of the volume as a whole. But really the publishers ought to supply a special lectern with the book, if they expect it to come into general use. One thinks twice before lifting from its shelf a book which turns the scale at something like eight pounds and a half.

Nor is Messrs. Patchett and Macmorran's book quite free from the imputation of unwieldiness, though its portability is greater than that of the ponderous tome of the other brace of lawyers. Perhaps it is necessary that all the eighty Acts in the second edition of 'Lumley' should be printed *in extenso*; but we are not sure that those who are specially interested in the exact verbiage of Acts of Parliament on a particular subject may not prefer to search for minutiae of legislative language in special manuals, such as Mr. Dalton's book on 'Local Loans,' and Messrs. Michael and Will's book on 'Gas and Water.' This, however, is largely a matter of taste; and for those who like to invest in a single law book about the Public Health Act and its incorporated statutes, probably Messrs. Patchett and Macmorran's volume is as good and complete a book as could be found. But it is not without its defects. The first edition of the work was brought out in a hurry by Mr. Lumley immediately after the passing of the Public Health Act, and bore, as was to be expected, evidences of hasty compilation. If the learned author had been alive to have himself revised the second edition, the errors and crudities of the first would no doubt have been set right. But the present editors (whom now to know is perhaps to argue oneself unknown, but of whom it is safe to say that their forensic distinction has not been won by outward and visible erudition in sanitary cases) are probably unacquainted with the official details familiar to Mr. Lumley. These, trivial in themselves, are nevertheless important to be given correctly. For example, the Public Works Loan Commissioners do not, as stated on page 279, lend money at 3½ per cent. The lowest rate at which they will make advances is, and always has been, 3½ per cent.; and the scale of charges quoted in the footnote to Sect. 243 has for some considerable time been quite out of date. There is a newer set of instructions as to applications for provisional orders than that quoted on page 348, and numerous other instances might be cited of want of touch with official documents and practice. It is but fair to say, however, that on all the important clauses of the Public Health Act, especially those that lend themselves to ingenious legal permutations, Messrs. Patchett and Macmorran's notes are very full and precise. They have taken enormous pains to give the very latest decisions of the Courts, even going so far as to reprint some pages for this purpose. We cannot, however, compliment them on their chronological arrangement of the appended Acts correlated to the Act of 1875. Surely it would have been simpler to print all the Artisans' Dwellings Acts together, the Waterworks Clauses Acts together, and so forth. Facility of reference is an indispensable desideratum in all text-books of this description, but it appears to be almost the last thing that compilers can bring themselves to consider.

The other books (4 and 5) mentioned at the head of these observations need no extended notice. Dr. Hime's little gold-edged guide is the best of the two, but it is marred by one or two serious errors. On p. 146 he stultifies his own remarks on p. 137 as to the Alkali Acts; and on p. 145 his remarks on p. 122 as to the Canal Boats Act. A descriptive list of circulars issued by the Local Government Board is quite useless for any practical purpose. But the tables and information on various sanitary points—such as rainfall, water analysis, soils, and the like—are very capably done, and the Public Health Act itself is annotated carefully and intelligently. Dr. Husband's book (5) is very confusing, with its objectionable initials on every page (L. A. standing for Local Authority, and so forth), and his interpretations of the law are not

always legally defensible. There is no index and no table of contents. For reference purposes the book is therefore useless as 'a digest of the Sanitary Acts of England and Scotland.'

L'Hygiène dans la Construction des Habitations Privées.

Par le DR. FÉLIX PUTZEYS et M. E. PUTZEYS. Librairie Polytechnique, Liège.

THIS work, which is the joint production of a doctor and an engineer, is a satisfactory résumé of the better known works upon the subject that have appeared in England, France, and Germany. If we may divide it into two parts, theoretical and practical, for each of which, as we are informed, one author is separately responsible, we should say that the doctor's half is much better done than the engineer's.

The theoretical requirements of each division of the work are well stated, but when the practical application of these requirements has to be made we find an enumeration of the principal systems or appliances, but we are left to discover their relative merits very much by ourselves. This want of guidance will be found to be rather embarrassing by the young student, for whose benefit the work was primarily designed.

The book is divided into eight chapters. The first chapter is upon the selection of a site for a house. In speaking of the temperature of soils some experiments are referred to which were carried out at Brussels to ascertain the temperature of the subsoil at different depths beneath the surface. The result of these experiments accords very nearly with that obtained in a similar manner in England. 'In Brussels (MM. Putzeys say) a thermometer, placed at 3.88 mètres underground, attained its maximum in September and its minimum in April. Another thermometer, sunk to a depth of 24 feet, marked the highest temperature on December 15, and the lowest on July 15. As you descend the difference between winter and summer diminishes more and more, and it ceases to be perceptible in temperate zones at a distance of from 17 to 26 mètres from the surface. At this level the uniform degree of heat is about equal to the average temperature of the locality.'

A reference is made to the observations of M. Delbrück (de Halle), and of M. Pfeiffer (de Weimar), who consider that they have verified the existence of a connection between the temperature of the soil and the development or extinction of choleraic epidemics.

After referring to the undoubted decrease in pulmonary consumption in England wherever works of deep drainage have been carried out, MM. Putzeys make the following statement about the military prison of Möllersdorf, near Vienna, on the authority of Nowak:—'The prisoners before being sent there had to undergo a medical examination, and they were never retained there if they showed any disposition towards tubercular consumption; and yet among 200 prisoners we find as many as 50 deaths every year, although the diet and occupations of the prisoners, and the general attention bestowed upon them are superior to those to be met with in other military prisons. This frightful mortality is almost entirely caused by consumption, to which disease even the most hardy fall victims. The soil of this prison is clayey, and is saturated with water. Moisture oozes from all the walls, and betrays itself all over the building by a mouldy smell.' Dreadful, indeed, as is such a state of affairs, we are not told of the undertaking of any remedial measures.

The subdivisions treating of damp-proof courses and hollow walls are tolerably complete, and that on 'ground air,' or the air contained in various soils, is a useful summary of our knowledge upon the subject. We were in some doubt as to the identity of the Mr. Knight whose opinions are quoted at p. 46; but we find from a footnote that Knight's Annotated Model By-laws are referred to.

Chapter II. refers to building materials. Speaking of the facility with which air passes through many materials

which we are apt to regard as impervious, he quotes the rather startling experiment of Von Pettenkofer. Upon an impervious base he constructed with bricks and ordinary mortar a portion of wall having a superficial surface of 1 square mètre, and, being 0.30 mètre thick (about 1 foot); each of the larger faces was covered with a sheet of metal having a small tube attached to it at its centre, and the three exposed edges were carefully covered with an impervious coating. It was found that on blowing down one of the tubes the current of air that escaped from the other extinguished a candle readily. The important subject of humidity in dwellings is treated of at considerable length, with detailed explanations of various ways of obviating or curing this dangerous defect.

Chapter III. treats of the house and its adjuncts. The height that should be permitted to a house in proportion to the width of the street upon which it abuts is a subject whose consideration leads our authors to lay down some very sensible rules. In Paris it appears that the following proportions have to be preserved.

	Mètres.	Mètres.
In streets less in width than 7.80 the height must not exceed	11.70	
" " " wider than 9.75 " " "	14.75	
On the Boulevards and in streets having a width of 20 " " "	17.55	

In Liège the following proportion is insisted upon.

	Mètres.	Mètres.
In streets less in width than 4 the height must not exceed	8	
" having a width from 4 to 8 " " "	11	
" " " 8 to 10 " " "	13	
" " " 10 to 12 " " "	15	
" " " 12 to 14 " " "	17	
" " " 14 to 16 " " "	18	
" " a width of 16 mètres at least, and on quays " " "	19	
" " a width of 20 metres or more " " "	20	

These regulations are condemned as being insufficient for the purpose of providing sufficient air and light to the houses, and the learned work of Ad. Vogt, of Bern, is referred to as being the only treatise that has put this subject upon a satisfactory basis. This painstaking writer assumes that every building should be exposed to the sun for at least four hours upon the shortest day of the year, and gives a valuable table by which the angle of incidence may be calculated for various latitudes.

The advice given upon the disposition of the various apartments of the house and of such adjuncts as laundry and stables is clear and to the point.

Chapter IV., which treats of warming, contains a tolerably complete account of grates, stoves, and of systems of warming by hot air, hot water, gas, and steam. The stove invented by the ingenious M. Wazon is well worth attention. It professes to be smoke-consuming, at the same time that it extracts the foul air from the room, and delivers fresh air, warmed or cool, as may be desired.

Chapter V. treats of ventilation. Chapter VI. is a fairly exhaustive study of systems of lighting by oil, gas, and electricity. Chapter VII. takes up the subject of water supply; and in Chapter VIII. the disposal of domestic waste (sewage, waste water, ashes, &c.), is considered in detail. The various systems of sewage disposal are divided as follows:—

1. Water carriage.
 - a. Single system of sewers.
 - b. Double system of sewers.
2. Dry disposal.
 - a. Earth closets.
 - b. The Goux system.
 - c. Ash closets.
3. Other systems.
 - a. Fixed cesspits.
 - b. Movable cesspits.
 - c. Liernur's pneumatic system.

The first of these three divisions of the subject is treated of at great length; drains, waste and soil pipes, traps, closets of all kinds (illustrating most of the best known

English appliances), flushing tanks, waste-preventing cisterns, &c., are clearly described. The other systems are necessarily disposed of at more moderate length, and the work concludes with a useful chapter upon the best means for disposing of the sewage of an isolated country house.

This work contains a great deal of information on sanitary subjects, and in parts is singularly complete. The plates at the end of the volume that have been specially drawn are all that could be desired, but the illustrations in the text are simply trade catalogue engravings, some of them of a rather coarse description. The English blocks, with their lettering and dimensions, in some cases, must have a strange appearance to foreign eyes. If MM. Putzeys in another edition would not only describe the various systems of warming, lighting, drainage, &c., but would attempt a judicial comparison of their merits, we think that they would add considerably to the value of a very useful volume.

Description d'un Nouveau Système de Pavillons Permanents pour le Traitement des Maladies Epidémiques et Contagieuses. Par le Dr. Félix Putzeys et E. Putzeys. Librairie Polytechnique, Liège.

THIS description of Dr. Putzeys' pavilions for contagious diseases is interesting, and may with advantage be compared with similar work that has been lately carried out in this country.

The subject of Dr. Putzeys' essay covers simply the construction, heating, and ventilation of a detached one-storied pavilion, the unit as it were of a large hospital, and he does not enter into such subjects as the choice of site, the aspect and prospect of the building, the necessary space that should intervene between the blocks, or their relative disposition and grouping.

The importance of these points is fully admitted, but the author considers them to be outside the scope of his present work.

The drawing accompanying the essay shows a ward for twenty beds, the dimensions of which are as follows: 31.20 mètres in length, 7 mètres in width, and 5.35 mètres in height, to the centre of the curved ceiling. At a height of 4 mètres cambered wrought iron trusses are placed, and the lower curved members of the trusses are connected together with slightly arched fillings-in of tiles or thin Dutch bricks.

Dr. Putzeys claims two advantages for his cambered ceilings. Firstly, he obtains larger cubical contents with the same height of ridge and walls; and secondly, that he rounds off the angles of the ceiling which is admittedly desirable as diminishing the corners that retain dust and germs.

Now for our part we cannot see that the second advantage is obtained; and though the first advantage is gained, it is only obtained at considerable additional expense. We would suggest that the arrangement which is being advocated in England, namely, that of flat ceilings with well-rounded junction between the latter and the walls is at once a better and cheaper disposition. The vertical angles of the walls should also be rounded off, although they are not so shown in the work before us.

The section of the pavilion represents a surface of 32 square mètres, giving a cube of 50 mètres per bed. If we refer to similar work in England, we shall find that 6 feet 6 inches lineal of wall space, 85 feet superficial of floor space, and 1,000 feet cube of air space per bed is generally considered sufficient, so that Dr. Putzeys' provision may be accepted as being liberal in the extreme.

The pavilion is extended at each end beyond the limits of the ward. In the extension at one end we find a central passage, which forms the entrance lobby of the building, with, on one hand, the 'tisanerie,' having a closed kitchen used in preparation of food and medicines, &c., and in this room the bath is kept. On the other hand the doctor's room is shown, with a closed

stove for warming the apartment. The addition at the other end is similarly divided into three. In the centre is a passage for exit, with on one side a room containing two water-closets and a urinal, and on the other side a similar room with two lavatory basins and a sink.

It would seem to be very undesirable to have a separate exit passage; we fancy that this door would practically be always locked, and so we think the space might have been better utilised. We would point out that the closets are not at all well placed, and should have been detached from the ward by cross ventilated lobbies; that the 'tisanerie' is not a proper place for the bath (for filling and emptying which no provision appears to have been made); that a doctor's room would be more appropriately placed (in our view) in the general administrative buildings; and that the 'tisanerie,' which practically represents the nurse's room, is not provided with a window overlooking the ward.

To continue the doctor's description of his pavilion, we find that he requires that the walls and ceiling shall be rendered in Keen's cement or with stucco trowelled to a polished surface, so that it can be frequently washed with disinfectants.

The walls, he considers, should have a thickness of .33 mètres, which is practically $1\frac{1}{2}$ brick. In very exposed positions he recommends hollow walls, though their use in England is not so limited, and is greatly to be recommended for hospital buildings under all circumstances.

Dr. Putzeys advises the execution of careful subsoil drainage, and the installation of an impermeable platform of concrete covered with asphalt under the building. The floor is shown to be of hard wood parquet bedded in bitumen upon the concrete.

The water-closets are fitted up in the ordinary English manner.

The ventilation is ingeniously arranged. Between the ceiling and the ridge a continuous foul air duct is formed, delivering into a foul air chamber over the 'tisanerie' and doctor's room, which is obtained by placing flat ceilings over these rooms at the level of the springing of the trusses. From this foul air chamber eight flues in an internal wall descend and enter a duct under the floors of the rooms, and this duct in turn is connected with air spaces in rear of the stoves already mentioned.

When the stoves are in use the air chambers become heated, and a powerful extraction current is established. In the ceiling of the ward are numerous openings into the foul air duct, fitted with movable metal louvres. Dr. Putzeys states that the fire in the 'tisanerie' is always in use, so that the system of extraction is constantly in action, but in order to provide for an emergency, when the stove might be out of use, he has provided three extraction cowls in direct communication with the foul air duct, but closed when the ordinary system of extraction is in use by a Boyle's ventilator arranged in form of a valve.

For the proper ventilation of an infectious ward our author considers that each patient should be provided with 150 mètres of fresh air per hour, which means the complete changing of the atmosphere of the room three times in each hour. The principal inlets of fresh air that can be used in warm weather being the windows, we notice that he has advisedly discarded the Continental casements and employs double hung sashes with fan sashes on centres. Air is also admitted at the skirting level, and in winter is warmed by passing over hot water pipes.

At each window a coil of hot water pipes is placed to assist in the general warming of the ward. Where the proper attendance cannot be obtained to look after a hot water circulation, Dr. Putzeys admits the use of stoves, but not otherwise.

This system has been adopted in a pavilion recently erected at Verviers, and has, we are told, given great satisfaction.

In conclusion, we think that the design before us is a great improvement upon anything of the sort that we have seen abroad, especially in the careful treatment of the

subject of ventilation, though we venture to think its author might probably improve it by reference to work of the kind recently carried out here.

NOTES ON BOOKS.

1. *Gas Works Statistics*, 1885. Seventh Issue, pp. 110. Price 3s. 6d.
2. *Water Works Statistics*, 1885. Fifth Issue, pp. 40. Price 2s. 6d.
3. *The Gas and Water Companies' Directory*, 1885. Ninth Issue, pp. 258. Price 4s.

Edited by CHARLES W. HASTINGS. Scientific Publishing Company, Limited, 22 Buckingham Street, W.C.

THESE three useful publications are correlated the one with the other. No. 1 gives particulars as to gas companies and gas departments of corporations in as many as 1,049 towns at home and abroad, stating in the great majority of cases the number of tons carbonised, the annual make and sale of gas and its illuminating power, the price per 1,000 cubic feet, the number of consumers, and the dividend paid. If particulars are desired as to the capital expenditure of each company, its address or officers, Book No. 3 must be referred to. This gives the date of formation of the undertaking, its share and loan capital issued, its dividends, the name of the chairman, engineer or manager, secretary, address, distance from London and by what lines of railway, population, and the like. Similar particulars as to water companies are also given in No. 3; and in No. 2, which is a much thinner book than the others, are contained particulars as to the source of water supply and whether by gravitation or pumping, the quantity raised per annum, the water rate or other charge, if constant service is given, &c., in 286 English and foreign towns. No doubt Mr. Hastings is aware of the Parliamentary Return as to Urban Water Supply in 1879, which contains particulars as to 944 districts. Might he not extend his list considerably from this source? All these books are carefully, and, so far as we have been able to check them, accurately compiled, and they ought to be very useful to those connected with the important enterprises of gas and water.

The Science of Sanitation in Plain Language.

THIS is a sensible little pamphlet by Sharp & Co., of 11 Holborn Circus. After describing the ordinary defects of sanitary work, Messrs. Sharp describe and illustrate three systems. 1. The old pan-closet and closed soil-pipe. 2. 'A system of house-drain ventilation of 1875 date,' that bears some resemblance to the arrangement authorised by the Model By-laws. 3. Their 'continuous' system of house-drain ventilation, in which the soil-pipe is used as an inlet for fresh air, and an extraction-pipe is attached to the house side of the disconnecting-trap placed in front of the premises. A few general hints on sanitary subjects conclude this pamphlet, which Messrs. Sharp have allowed to tell its own tale without the interposition of any of the usual testimonials.

Perfect Ventilation. By the Æolus Waterspray Ventilating Company, 235 High Holborn, W.C.

THIS work treats in an exhaustive manner of the Æolus Waterspray system of ventilation, and calls attention to the many notable buildings, both at home and abroad, that have been successfully ventilated by its aid. It is unnecessary to enter into details of the Æolus system, which is widely known, and to the value of which our own columns have borne testimony. This little work under review, profusely illustrated, shows the application of the Æolus to all kinds of buildings, and in connection with heating apparatus also. Examples of the cost of working,

as compared with other systems of heating, are given, showing an advantage in favour of the Æolus. Illustrations of the heating apparatus used by the company are shown, and ventilation generally is exhaustively discussed, including a very cheap mode adapted for workmen's houses, industrial dwellings, &c. A chapter is devoted to the Æolus automatic system of ship ventilation, and prominence is given to several ventilators, cowls, &c., the interest in which the company have acquired, and special features of other makers that they use in connection with their own. A portion of the work is devoted to electro-motors and other electrical apparatus connected with bells, burglar and fire alarms, &c. The work is concluded with a number of well-executed diagrams of some of the principal buildings ventilated by the company, including the offices of the *Daily Telegraph*. It has, we believe, been compiled by Mr. R. Oakley, the engineer to the company.

Tenth Report of the State Board of Health for Minnesota. 1884.

WE are much indebted to the Boards of Health of the American States for the very valuable and voluminous reports of their doings, with which they favour us. If we cannot review them at length, it is from no lack of appreciation of their interest, but because (sanitary matters in America being a good deal behind our own experiences) the lessons which the reports teach are of no special significance to us in England. The Minnesota Board of Health is evidently extremely anxious to do its duty, and to get the laws of public hygiene understood and acted upon by the people entrusted to its care. The record of its efforts to stamp out small-pox, for example, may be commended to the attention of our English Local Government Board. Americans seem to have an unconquerable hankering after statistics, but to be incapable of summarising events or epidemics. If we may venture upon a friendly criticism of this report (it would equally serve for the report of any other State Board of Health), we would say that its effect is almost wholly lost by diffusiveness. A closely reasoned epigrammatic account of the Board's doings and aspirations might command general attention. It is hopeless to expect people to wade through 400 pages of diurnal detail.

LAW REPORTS.

UNWHOLESOME MEAT AT FRODSHAM.

AT the Eddisbury Petty Sessions, Cheshire, on Wednesday, the 27th ult., Rupert J. Saunders, of Main Street, Frodsham, butcher and sausage-maker, was summoned by the Runcorn Union Rural Sanitary Authority for having in his possession a quantity of meat for the purpose of preparation for sale, the same being unwholesome and unfit for food of man. Mr. W. H. Linaker, of the firm of Messrs. Linaker and Linaker, appeared to prosecute on behalf of the sanitary authority, and Mr. Dreaper, of Chester, defended. Mr. James Farrington, inspector, proved the seizure of the meat, and Dr. J. Adams, medical officer of health, gave evidence as to the state and condition of the same. The defendant was fined 10s. and costs.

THE FOOD AND DRUGS ACT.—A HEAVY FINE.

AT the Birmingham Police-court, before Messrs. Ellis and Marris, Adam Simpson, farmer, of Haunton Manor Farm, near Tamworth, was summoned, at the instance of Mr. John Parker, chief inspector of nuisances, for selling milk adulterated with 24 per cent. of added water. Mr. C. A. Carter, assistant town clerk, prosecuted. Mr. Parker, inspector under the Food and Drugs Acts, visited New Street Station on April 28 last, and took a sample of the milk consigned by the defendant to James Holt, of Cowper Street, Birmingham, and submitted the same to the public analyst, which, upon analysis, was found to contain 24 per cent. of added water. The churn which

contained the milk was labelled 'Contents warranted new and pure milk,' and signed A. Simpson—[an ominous name—Ed.] The guard of the train that conveyed the milk deposed that the churn was placed in his van at Elford Station, and had not been disturbed until taken out at Birmingham, when Mr. Parker took charge of it. Defendant stated that he was totally unaware of the adulteration. Some time ago he complained to his cowman that there was not a sufficient quantity of milk, and he supposed his man had put water in to make up the quantity; he was very sorry that such a thing had occurred. Defendant was fined 10*l.* and costs.

SANITARY JOTTINGS.

PUBLIC HEALTH SOCIETY OF CALCUTTA.—The third lecture under the auspices of this Society was delivered by Thomas Jones, Esq., the subject being 'Drainage and Preventable Disease in Calcutta.'

An epidemic of measles has raged in Dublin since the beginning of the year. It has not, however, assumed to anything like the same proportions as in former years. In the month of April 71 deaths from this disease occurred. This rate of mortality, though high, was, however, 3·3 per 1,000 persons less than in the previous month.

In consequence of an outbreak of small-pox at Brotton-in-Cleveland, the schools have been closed by order of the School Board.

There were ninety-two applications for the surveyorship of Wednesbury, at 200*l.* per annum, the majority of whom were very experienced men.

A meeting representing the East Kent Combination of Sanitary Authorities has decided to forward a memorial to the Local Government Board, urging upon them the desirability of a legislative enactment for the compulsory notification of infectious diseases. Instances were pointed out where the concealment of these diseases by medical men and others, until they broke out in a district, had been attended by disastrous results.

SEWERAGE.

Mr. Laws, City Engineer of Newcastle, has prepared a plan for the efficient sewerage of the Ouseburn district of that city. Some years ago the Ouseburn was a nearly pellucid rivulet, and a walk along its picturesque banks was most enjoyable; now this small stream receives the sewage of the suburban district of Gosforth, comprising about 6,000 inhabitants, which, it is almost needless to state, has materially diminished its attractiveness, as well as proved a nuisance in the locality through which it passes. Mr. Laws' scheme embraces a main sewer and two branches to serve other districts, the cost of which to the city he estimates at 12,664*l.* He also urges the desirability of the co-operation of the Gosforth Local Board in the scheme to render it efficient, which they have agreed to give.

The annual report of Mr. W. S. Till, borough surveyor of Birmingham, shows that during 1884 2 miles 7 furlongs 97 yards of public sewers were constructed, making the total length of sewers under the charge of the Town Council 186 miles, 7 furlongs, 30 yards; 372 private drains were laid into sewers, and 6 miles 6 furlongs 194 yards of streets and roads were declared highways, bringing the total highways in the borough to 192 miles 3 furlongs, 129 yards. There were also constructed 4 miles 1 furlong 33 yards of undeclared highways, and 2 miles, 3 furlongs and 2 yards of private road and passages. Plans were approved for 1,285 new buildings, an increase of 50 compared with the previous year, and there were 947 notices concerning dangerous structures forwarded to owners, an increase of 180 on those of 1883, the result probably of the recent inquiry into the general condition of the dwellings of the poor.

The pumping station and sewerage works in connection with the Stourbridge Main Drainage Board were formally

opened on April 29. The Board was formed in 1881, as the result of a joint application by the Improvement Commissioners and the Rural Sanitary Authority to the Local Government Board for a provisional order. The district covered includes Stourbridge, Upper Swinford, Amblecote, and Wollaston, with a total population amounting to nearly 20,000. The system of treatment eventually carried out was broad irrigation, the sewage being collected at the pumping station, whence it is conveyed to about 130 acres of land near Whittington. The estimated dry weather flow of sewage is between 500,000 and 600,000 gallons per day. Duplicate pumping-engines have been supplied by Messrs. Hathorn, Davey, & Co., and have a total lifting capacity of 2,000,000 gallons per day. The rising main is 2½ miles in length, composed of 14-inch iron pipes, and by causing the main at its highest point between the pumping station and the farm to act as a syphon, by an arrangement which is under the control of the engineer, it is calculated that one-fifth of the pumping power will be saved. The carriers on the sewage main consist of about six miles' length of earthenware pipes. The original estimate for the works was 18,116*l.*; the actual cost is not expected to exceed 17,600*l.*, or, including cost of land, about 25,000*l.* There is a great deal yet to be done in the matter of drainage of the district before the Stour will be entirely cleansed from the pollution which has hitherto flowed into it.

WATER SUPPLY.

Messrs. Le Grand & Sutcliffe, Artesian Well Engineers and Contractors, Bunhill Row, London, have recently succeeded in tapping a fine spring of water at Alnwick by means of an Abyssinian tube-well bored to a depth of 72 feet. The same firm have also settled a most important 'water question' at Southampton, where, as a result of their operations, there is now a daily supply of four million gallons of excellent water.

CORRESPONDENCE.

Audi alteram partem.

[All communications must bear the signature of the writer, not necessarily for publication.]

THE VENTILATION OF HOUSE-DRAINS AND SOIL-PIPES.

As three letters have now appeared in the *SANITARY RECORD*, in reference to our 'Continuous Current' system of house-drain and soil-pipe ventilation, which you kindly noticed in your March number, we beg leave to reply to them.

Referring to H. C. B.'s objections—p. 486—to the arrangement of what he terms our anti-vacuum pipes (which arrangement, by the way, we doubt if he has rightly understood), we can only say that, even granting that 'the angle of reflection' from the periphery of a soil-pipe may be equal to the 'angle of incidence' thereon, we entirely fail to see how the passage of soil from an upper closet could choke up the pipes in question.

Referring to his views on traps, we cannot do better than quote Mr. Baldwin Latham, who says (*Sanitary Engineering*, p. 425): 'It cannot be too fully impressed upon all persons using traps that no trap can be relied upon unless protected by a ventilator to relieve it from pressure.'

In reply to Mr. Masters (p. 486), we can only suggest that the difference, which he seems unable to perceive, between his system and our own, may be that, whereas his is (as he says) intermittent, ours has been shown to be continuous in action.

The aim which we had in view when we illustrated our system was not to claim any great discovery, but to call forth opinions as to which is really the best, simplest, and least expensive method of dealing with the important question of drain ventilation.

As far as we can understand Lieut.-Col. Turnbull's system, it seems to differ very materially from our own, as we employ a single ventilation-current, whereas he appears to employ two—one for the drain and another for the soil-pipes. The merits of rotary cowls were fully discussed in your October and November numbers, 1884.

11 Holborn Circus, London, F.C. SHARP & CO.

DRAIN TESTING WITH 'SANITAS' OR 'TEREBENE' OIL.

The communication from Mr. MacMahon, on page 502, is interesting; but, so far as my experience goes, testing by smell alone is not nearly so satisfactory as by both sight and smell combined. With the smoke test you can convince people of leaking drains, &c., where any amount of smell would hardly do so. And the smoke also indicates more clearly where the defect is.

I know a case of a gentleman who had his drainage all sorted; then two years after it was professionally tested by the oil test, when all was found correct except a slight smell somewhere near an upper flat w.c. The gentleman requested to have the exact spot where the defect was pointed out, but this could not be done. He demurred to disturbing his fittings, and sent for another party to apply the smoke test, when the defect—a small leak at a joint in the soil-pipe—was soon discovered and put right in a few minutes.

The oil test, as Mr. MacMahon points out, has one advantage—viz., in not requiring particular apparatus, and it is serviceable in many cases.

21 Renfrew Street, Glasgow.
May 18.

W. P. BUCHAN.

SPINDLE-VALVE STENCH-TRAPS.

In regard to the spindle-valve stench-trap shown on page 531, as patented by Mr. T. S. Truss, Chiswick, Middlesex, in 1884, I would like to ask him wherein consists its difference between, or 'improvement' upon, the spindle-valve trap illustrated by figure 70 in my patent of July 9, 1878?

I would also ask Mr. Francis William Kelly, Minneapolis, Minn., wherein does his 'anti-syphoning Ball Trap,' dated Sept. 9, 1884, differ from the siphon ball-trap of mine illustrated at Fig. 278 of the fourth edition of my book on 'Plumbing,' published in January 1883?

21 Renfrew Street, Glasgow.
May 18.

W. P. BUCHAN.

DAMAGES FOR DEFECTIVE DRAINS.

I venture to think that the paragraph which appears under the above heading in the current number of the SANITARY RECORD (page 500), is somewhat misleading, as it might be supposed from this that the landlord of a house, and not the tenant, is the party liable for maintaining the drains in an efficient sanitary condition. In an ordinary lease, as drawn at the present time, I believe that there is, almost without exception, a covenant which provides that the tenant shall keep the drains, amongst other things, in good repair, and, this being so, there can hardly be a doubt as to the tenant's liability. I have been unable to obtain a full report of the case in question (*Chichester v. Lance*), but it seems to me that it is exceptional, and it is stated in a paragraph relating thereto which appeared in the *Globe* of April 15, that the 'house had been taken for three years, under an agreement which made no special mention of the drains.'

It is to be hoped that when it becomes law that landlords are to be held responsible for the sanitary state of their houses, it will, at the same time, be made illegal for tenants to, in any way, interfere with the drains, for so much ignorance exists, in respect of the most simple sanitary matters, that it is quite possible for a house to be

delivered up to a lessee in a perfect sanitary state, and before long to become quite the reverse. In a case which came under my own observation, a short time since, the tenant of a house had closed the end of a bath waste, which was properly disconnected from the drain, as he objected to pipes being left open at the end, feeling quite sure that it was not correct.

A SANITARY ENGINEER.

PREVENTION OF FIRES IN THEATRES.

Our attention has lately been drawn to an article on the above subject appearing in your issue of May 15, p. 509. Will you allow us to point out the objection to tungstate of soda, recommended by Captain A. W. Shean, which is this—viz., that it scales off, and has to be applied every two or three weeks to be effective. Our cyanite, on the contrary, is permanent in effect when once applied, and we may add, while on the subject, that it is the only means of fire prevention which has been certified and approved by Sir William Harcourt, Bart., Captain Shaw, C.B., C. J. Phipps, Esq., F.S.A. (architect of over forty theatres), Thomas Verity, Esq., Surveyor to the Lord Chamberlain, and other distinguished authorities. You further mention that wood may be made incombustible by soaking over four or five days in certain chemicals. Now, with our cyanite, soaking is perfectly unnecessary; one liberal coat with a brush, or at most two coats, rendering the wood perfectly fireproof—i.e. proof against flame.

Amongst the large number of buildings which we have cyanited (including the Home Secretary's private house) we may mention that cyanite has been used in nearly all the theatres in London of recent construction, including the Prince's, Empire, Novelty, re-constructed Criterion, &c.

E. E. MARRIOTT.

ERRATA.

In the SANITARY RECORD for May 15, page 540, in the last paragraph of Mr. Fredk. H. Smith's letter, commencing 'If after eight hours,' &c., read 'after,' instead of 'if.' After the words 'Mr. W. H. Drake' in next line, read 'has' for 'had.'

In Mr. Barnes Austin's letter, page 540, after the word 'judgment,' six lines from the bottom, there should have been a full stop. Also for the word 'when,' substitute 'However.'

THE HOUSING OF THE WORKING CLASSES.

*How best to help the slender store,
How mend the dwellings of the poor?*

THE HOUSING OF COLLIERIES.—Although much has been done during recent years by the owners of collieries and others to improve the homes of our mining population, much more requires to be done before that large section of the industrial community are afforded full opportunities of obeying the canons of health or morality. Thousands of pitmen in the counties of Durham and Northumberland now live in old cottages provided by their employers, which have been built upwards of forty years ago, and are a reproach to our boasted civilisation. Many of these wretched hovels are situated within a circuit of twenty miles round Newcastle; they consist of one room from which a ladder reaches up through a trap-door to an unceiled and miserable loft or garret, which is only separated from the sky by a layer of tiles, which rarely suffices to keep out the rain, rendering this upper storey useless for habitation. The family, therefore, whatever their number may be, necessarily crowd into their one only habitable apartment, often with the most pernicious results. As an illustration of the evil effects of these un-

sanitary dwellings, we quote from a report presented to the Hexham Rural Sanitary Authority at their last monthly meeting, by Dr. MacLagan, medical officer of health, who stated that on May 27 a case of scarlatina was reported from Water Row, Wylam. On visiting this case he found that this very small one-roomed cottage and loft held nine persons. The father, a miner, was at work, and the mother also was at work in some gardens near; the seven children of the family being under the care of the eldest, who could not be more than ten years of age. The child affected was in bed, having the baby beside her, the latter's arms being round her neck. While in the cottage, a troop of children came in, whom he found to be the children of the neighbours. Under such circumstances it was almost a hopeless task to attempt to stay the progress of an outbreak of infectious disease. On the same day a case of scarlatina was reported from Wylam, where it was said to be well known that children went to the school this child attended from infected houses. Dr. MacLagan further stated that the condition of many of the cottages in which several of these cases of infectious disease had appeared was deplorably inadequate either for purposes of health or decency, and probably if the members of the Royal Commission directed their attention to the housing of miners in many of the rural villages of England, they might find quite as much to warrant their interference in such homes as in the worst parts of many large towns. The Chairman remarked that all they could do would be to summon this unfortunate miner for overcrowding. They could not close the houses; they were built before the Act became law, otherwise he would close the whole of Wylam; it was the plague-spot in the district. They were damp, miserable houses, and it was heart-breaking to go and see them. It will be remembered that George Stephenson, the eminent engineer, was born in one of these colliery cottages at Wylam, and it is unfortunate, after the lustre he shed on his native place, that it should now be in such evil repute. Wylam, however, is by no means singular amongst colliery villages in the north for its sanitary deficiencies; its counterpart may be seen at Seghill, Westmoor, and other pit-villages near to Newcastle. If inquiries were instituted, revelations could be made as to the condition of these places which would startle even the Royal Commissioners.

The Duke of Northumberland proposed to build some new workmen's dwellings at Alnwick, but, as the Local Board did not approve of the plans submitted to them, the project has been abandoned for the present.

CREMATION NOTES.

A CREMATION society has been formed at Worcester, Massachusetts.

Two 'crematories' are about to be erected in the Communal cemeteries of Ravenna and Luga.

A deputation from the Urne Society has waited on the President of the Austrian Cabinet to ask that cremation should be authorised. This society comprises 800 members, amongst whom every class is represented; they have collected sufficient funds for the construction of a crematory apparatus.

PARKS AND OPEN SPACES.

God Almighty first planted a garden, and indeed it is the purest of all pleasures.

ON May 29 the ground attached to Christ Church, Battersea, which has been laid out and provided with seats by the Metropolitan Public Gardens Association, was formally opened to the public by the Countess of

Cadogan. This ground has been handed over in association by the Rev. H. Guildford Sprigg, vicar, is proving a most attractive resting-place in the thoroughfare.

Mr. Peter Denny, of Helenslie, and Mr. John McElroy of College Park, formally presented the inhabitant Dumbarton with a public park on Saturday, May 10. It has cost about 20,000*l*.

EXHIBITIONS.

At the eleventh Congress of the Italian Medical Congress will be held next September at Perouse, there will be an Exhibition of sanitary as well as of medical and surgical appliances.

SANITARY INSTITUTE OF GREAT BRITAIN HEALTH EXHIBITION, 1885.

An Exhibition of Sanitary Apparatus and Appliances and of Domestic Use and Economy, will be held in the Fleece Hotel, Belgrave Gate, Leicester, from Sept. 22 to Oct. 10, 1885, in connection with the Eighth Autumn Congress of the Institute.

Four Silver Medals are offered by the Gas Department Corporation of Leicester for Gas Stoves exhibited under the following classes:—

1. For the best Gas Stove or Gas Apparatus for cooking for families, to include means for heating a good supply of water.
2. For the best Gas Cooking Stove suitable for an artisan for at least six persons.
3. For the best and most economical Gas Fire.
4. For the best arrangement for Heating Baths by Gas.

Silver medals are also offered by the Exeter Gas Company for the best Gas Stove or Gas Apparatus for cooking for families, including a sufficient supply of hot water. 2. For and most economical open Gas Fire.

Forms of application for space and other particulars can be obtained of E. L. Box, Curator, 74A Margaret Street, London, W.

COMPETITIONS.

AMBULANCES.

THE Empress of Germany has offered 5,000 francs (£200) for the best model ambulance of wood. This prize will be competed for at Geneva. The merits of the ambulances will be judged by the International Committee of the Red Cross of Geneva.

WESTGARTH PRIZES.

The Committee appointed by the Council of the Society of Sanitary Writers to consider the Essays sent in for the above prizes, have reported that in their opinion none of the Essays realise the merits of the offer in such a manner as to justify them in recommending that the full amount of the prizes offered by Mr. Westgarth should be awarded. They recommended, however, that the amounting in all to £600 should be awarded as under:—

Three prizes of £100 each, to H. H. Bridgman, 43 Poulton Street, J. Corbett, 24 Barton Arcade, Manchester; W. Woodward, Street, Adelphi, W.C.

Three prizes of £50 each, to A. Wynter Blyth, Court House, Marylebone, W., and R. Greene, Berry Wood, Northampton; Dunscombe, City Engineer, Liverpool; C. Scott, Town Engineer, Belfast, and J. W. E. Tilley, Royal Avenue, Belfast.

Six prizes of £25 each, to A. H. De Wind, Comber, co. Louth, S. Fairfax, 3 St. Paul's Road, Camden Square, N.W.; J. Tetley, 8 North Audley Street, W.; T. E. Julian, 22 Palace Road, Roupell Park, S.W.; W. H. Newell, M.D., 201 Palisade, Jersey City, N.J.; United States of America; G. W. Unill, Lodge, Southfields, Wandsworth, S.W.

The Council, after consultation with Mr. Westgarth, have accepted the report of the Committee, and awarded the prizes as recommended. It has been determined that the three Essays to which prizes were awarded shall be published on behalf of the Society.

SANITARY DWELLINGS.

The Sassoon Institute of Bombay has offered its gold medal supplemented by a money prize of 300 rupees from the Municipal Commissioners, for the best design for sanitary dwellings for labouring classes.

THE PRIZE OF THE COMMISSION DE L'HYGIÈNE DE L'ENFANCE.

The Commission de l'Hygiène de l'Enfance offer a prize of value of 1,600 francs (£64) for the best essay on the following subject:—'Rechercher quels peuvent être les rapports de la syphilis rachitique dans la première enfance' (To discover the relation between rickets and syphilis in infants.)

APPOINTMENTS.

MEDICAL OFFICERS OF HEALTH.

- BARST**, Charles Theodore Uvo, L.R.C.P. Edin., L.R.C.S. Edin., has been appointed Medical Officer of Health for the Willington Quay Urban Sanitary District, Northumberland, at £40 per annum, *vice* Fletcher, resigned.
- BRAUND**, James Montague, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the North Division of the Stratton Rural Sanitary District, Cornwall, at £25 for one year.
- BYDEN**, Robert Thomas, L.R.C.P. Edin., L.R.C.S. Edin., has been re-appointed Medical Officer of Health for the Windhill Urban Sanitary District, Yorkshire, at £35 for one year.
- LEGG**, Walter, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Boston Port Sanitary District for one year (no fixed salary).
- EDLIN**, Edward Holberton, F.R.C.S. Edin., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Compton-Gifford Urban Sanitary District, Devonshire, at £22 per annum.
- ISMER**, Thomas, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Garstang Rural Sanitary District, Lancashire, at £50 for the year ending June 24, 1886.
- IRIFFITHS**, David, M.B., C.M. Univ. Edin., has been re-appointed Medical Officer of Health for the Llandilotalybon division of the Swansea Rural Sanitary District, at £60 for one year.
- IND**, Albert, L.R.C.S. Edin., and L.M., L.S.A. Lond., has been re-appointed Medical Officer of Health for the South Molton Urban Sanitary District, at £30 for one year, from the 24th inst.
- JONES**, Charles Richard, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Great Torrington Urban Sanitary District, at £10 for one year.
- LOUGHTON**, Lambert, L.R.C.P. Edin., L.R.C.S. Edin., has been appointed Medical Officer of Health for the Amersham Rural Sanitary District, at £50 per annum, *vice* Hosegood, whose appointment has expired.
- MARSHALL**, William Norris, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Newent Rural Sanitary District, at £40 for one year.
- MASON**, George, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Wisbech Urban Sanitary District, at £40 for one year.
- MILLETT**, George Bown, L.R.C.P. Edin., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Penzance Division of the Penzance Port Sanitary District, at £5 for one year.
- MORGAN**, Edward Rice, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Llangafelach Division of the Swansea Rural Sanitary District, at £60 for one year, *vice* Davies, deceased.
- OSBURN**, Cecil Anthony Perrier, L.R.C.P. Edin., L.R.C.S. Edin., has been appointed Medical Officer of Health for the Huntingdon Urban Sanitary District, at £24 per annum, *vice* Oldman, deceased.
- QUICK**, John, M.R.C.S. Eng., and L.M., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Penzance Rural Sanitary District, at £80 for one year.
- REES**, Hugh, M.R.C.S. Eng., L.S.A. Lond., the Medical Officer of Health for the combined Local Sanitary Districts, has been appointed Medical Officer of Health for the newly-formed Menai Bridge Urban Sanitary District, at £5 per annum.
- SMITH**, David Chadwick, M.D. Univ. Dub., has been appointed Medical Officer of Health for the Mutford and Lotherland Rural Sanitary District, and the Lowestoft Urban Sanitary District, at the rate of £130 per annum, from June 24 to September 20, *vice* Jeffery, deceased.
- STEELE**, William Dyne, M.D. Univ. Aberd., has been re-appointed Medical Officer of Health for the Abergavenny Urban Sanitary District, at £60 for one year.
- STUART**, William, M.B., C.M. Univ. Aberd., has been re-appointed Medical Officer of Health for the South Division of the Stratton Rural Sanitary District, at £15 for one year.
- TWINING**, Alfred Hughes, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Kingsbridge Rural Sanitary District, Devonshire, at £100 for one year.
- SYKES**, John Frederick Joseph, B.Sc. (Public Health), M.B., C.M. Edin., L.R.C.P. Lond., has been appointed Medical Officer of Health and Examiner of Gas for the Parish of St. Pancras, Middlesex, at £300 per annum, *vice* Murphy, resigned.
- WALKER**, Hunter Urquhart, L.R.C.P. Edin., L.R.C.S. Edin., has been appointed Medical Officer of Health for the Workop Urban Sanitary District, at £15 per annum, *vice* Hannan, resigned.

SURVEYORS, CLERKS TO GUARDIANS, INSPECTORS OF NUISANCES, &c.

- BOVEY**, Mr. John, Jun., has been appointed Collector of General District Rates, Water Rents, and Highway Rates to the Lower Brixham Local Board and Urban Sanitary Authority, Devonshire, at £37 per annum, *vice* Calley, resigned.
- BRENNARD**, Mr. Robert, has been elected a Member of the Ovenden Local Board and Urban Sanitary Authority, *vice* Bailey, deceased.
- CHURCH**, Mr. Walter, has been appointed Inspector of Nuisances for the Newbury Rural Sanitary District, at £70 per annum, *vice* Marshall, deceased.

- COCHRANE**, Mr. Thomas, Manager of the Carlisle and Cumberland Bank, has been appointed Treasurer to the Longtown Guardians and Rural Sanitary Authority, Cumberland, *vice* Jackson, deceased.
- COLEMAN**, Mr. A. T., has been elected a Member of the Ivybridge Local Board and Urban Sanitary Authority, *vice* Pooley, resigned.
- COLE**, Mr. H., has been elected a Member of the Ivybridge Local Board and Urban Sanitary Authority, Devonshire, *vice* Sherwill, resigned.
- COPLAND**, Mr. William Wallace, has been appointed Surveyor and Inspector of Nuisances to the Sheerness Local Board and Urban Sanitary Authority, at £70 and £80 per annum, *vice* Stringfellow, resigned.
- DAVIES**, Mr. Evan, has been elected a Member of the Mold Local Board and Urban Sanitary Authority, *vice* Roberts.
- DAVIES**, Mr. James, has been elected a Member of the Mountain Ash Local Board and Urban Sanitary Authority, *vice* Prichard, resigned.
- DAVIES**, Mr. Owen, has been appointed Inspector of Nuisances to the newly-formed Menai-Bridge Local Board and Urban Sanitary Authority, at £12 per annum.
- DUFTON**, Mr. Benjamin, has been appointed Clerk to the Pudsey Local Board and Urban Sanitary Authority, at £80 per annum, *vice* Lawson, resigned.
- DUNNETT**, Mr. Coleman, Branch Manager of the London and County Bank, has been re-appointed Treasurer to the Sandgate Local Board and Urban Sanitary Authority, in consequence of a technical informality in his previous appointment.
- EDINGER**, Mr. Philip, has been appointed Surveyor, Inspector of Nuisances, and Waterworks Manager to the Frome Local Board and Urban Sanitary Authority, at £180 per annum, *vice* Stow.
- EVANS**, Mr. Robert Benjamin, has been appointed Clerk to the Bethesda Improvement Commissioners and Urban Sanitary Authority, Carnarvonshire, at £60 per annum, *vice* Thomas, resigned.
- FORD**, Mr. Robert, has been elected a Member of the Ivybridge Local Board and Urban Sanitary Authority, *vice* Head, resigned.
- FOX**, Mr. Ambrose, has been re-appointed Inspector of Nuisances for the Garstang Rural Sanitary District, at £50 for the year ending June 24, 1886.
- GARRETT**, Mr. Thrale George, has been appointed Inspector of Nuisances for the Daventry Rural Sanitary District, at £45, for one year (not to devote the whole of his time to the duties), *vice* White, whose appointment has expired.
- HUGHES**, Mr. Thomas, has been appointed Collector to the newly formed Menai-Bridge Local Board and Urban Sanitary Authority, at 3 per cent. commission.
- JACKS**, Mr. William, has been elected a Member of the Kenilworth Local Board and Urban Sanitary Authority, *vice* Forrest, deceased.
- JOHNS**, Mr. Samuel, has been appointed Surveyor and Inspector of Nuisances to the Wallingford Union Rural Sanitary Authority, and Inspector under the Canal Boats Act, at £100 per annum, from year to year, *vice* Withers, whose appointment has expired.
- JULIAN**, Mr. Frederic Mason, Solicitor, has been appointed Clerk to the Smallthorne Local Board and Urban Sanitary Authority, Staffordshire, at £30 per annum, *vice* Tomkinson.
- KINNEIR**, Mr. Henry, has been appointed Clerk to the Swindon New Town Local Board and Urban Sanitary Authority, at £125 per annum, *vice* Townsend, deceased.
- LONSDALE**, Mr. Horace Blamire, Solicitor, has been appointed Clerk to the Carlisle Guardians and Rural Sanitary Authority, at £150 per annum, as Clerk to the Guardians; £50 per annum, as Clerk to the Rural Sanitary Authority; £30 per annum, as Clerk to the Assessment Committee; £15 per annum, as Clerk to the School Attendance Committee; and £12 12s. per annum, as Returning Officer at uncontested elections of Guardians, *vice* Mounsey, resigned (but who retains the office of Superintendent Registrar of Births, &c.).
- LUGG**, Mr. John, has been appointed Inspector of Nuisances for the Bideford Urban Sanitary District, Devonshire, at £10 10s. per annum, *vice* Major.
- MACKRELL**, Mr. James, has been elected a member of the Elland Local Board and Urban Sanitary Authority, Yorkshire, *vice* Farrar, resigned.
- MANSSELL**, Mr. W. R., has been elected a Member of the Wellington (Salop) Board of Improvement Commissioners and Urban Sanitary Authority, *vice* Corbett, deceased.
- MARSHALL**, Mr. Alfred, has been elected a Member of the Tunbridge Wells Board of Improvement Commissioners and Urban Sanitary Authority, *vice* Timins, deceased.
- MINTON**, Mr. E. E., has been appointed Treasurer *pro tem.* to the Leek Guardians and Rural Sanitary Authority, *vice* Whyatt, deceased.
- MITCHESON**, Mr. Thomas, Solicitor, has been appointed Clerk to the Liversedge Local Board and Urban Sanitary Authority, Yorkshire, at £50 per annum, *vice* Curry.
- O'KELLY**, Mr. Peter Francis, has been elected a Member of the Cannock Local Board and Urban Sanitary Authority, *vice* McGhie, resigned.
- OLLIVE**, Mr. J. E. S., has been appointed Clerk to the Wirral Guardians and Rural Sanitary Authority, at £130 per annum as Clerk to the Guardians; £80 per annum as Clerk to the Rural Sanitary Authority; £18 per annum as Clerk to the Assessment Committee; £12 per annum as Clerk to the School Attendance Committee; and £20 per annum as Returning Officer, *vice* Gregory, resigned.

OSBORNE, Mr. G. E., has been elected a Member of the Gillingham Local Board and Urban Sanitary Authority, *vice* Tassell, deceased.

PENTLOW, Mr. George, has been appointed Inspector of Nuisances for the Thrapston Rural Sanitary District, at £50 per annum, *vice* Spendlove, resigned.

PUGHE, Mr. William, Banker, has been appointed Treasurer to the newly-formed Menai-Bridge Local Board and Urban Sanitary Authority.

RIDDELL, Mr. Edward Mitford Hutton, Banker, has been appointed Treasurer to the Newark Town Council and Urban Sanitary Authority, *vice* Barton, resigned.

ROBBS, Mr. Decimus Mallett, Solicitor, has been appointed Clerk to the Gainsborough Local Board and Urban Sanitary Authority, at £200 per annum, *vice* Hayes, resigned.

SCOTT, Mr. E. M., has been appointed Surveyor to the Wednesbury Local Board and Urban Sanitary Authority, at £200 per annum, *vice* Fereday.

SHARMAN, Mr. S. E., has been re-appointed Inspector of Nuisances for the Sevenoaks Rural Sanitary District for one year.

SMALLBRIDGE, Mr. G., has been elected a Member of the Ivybridge Local Board and Urban Sanitary Authority, *vice* Robinson, resigned.

STEPHENSON, Mr. Richard John, Manager of the South Molton Branch of the National Provincial Bank of England, has been appointed Treasurer to the South Molton Guardians and Rural Sanitary Authority, *vice* Johnson, resigned.

STEPHENSON, Mr. John, has been re-appointed Inspector of Nuisances for the Boston Port Sanitary District, for one year (no fixed salary).

TAYLEUR, Mr. E. H., has been elected a Member of the Ivybridge Local Board and Urban Sanitary Authority, *vice* Crispin, resigned.

TOWNSEND, Mr. Henry Fox, has been appointed Clerk to the Swindon Old Town Local Board and Urban Sanitary Authority, at £60 per annum, *vice* Mr. James Copleston Townsend, deceased.

TURNOCK, Mr. William, has been appointed Clerk to the Chester Guardians and Rural Sanitary Authority, at £150 per annum as Clerk to the Guardians; £20 per annum as Clerk to the Rural Sanitary Authority; £45 per annum as Clerk to the Assessment Committee; £20 per annum as Clerk to the School Attendance Committee; and fees as Returning Officer, *vice* Keartland, deceased.

WALLIS, Mr. W. S., has been elected a Member of the Halsted Local Board and Urban Sanitary Authority, *vice* Dallman, resigned.

WELSFORD, The Rev. Henry Charles, has been elected a Member of the Ellesmere Local Board and Urban Sanitary Authority, *vice* Allinson, resigned.

WILLIAMS, Mr. John, has been re-appointed Inspector of Nuisances for the Cirencester Urban Sanitary District, at £50 for the year ending June 24, 1886.

WILLIAMSON, Mr. John, has been elected Chairman of the Cannock Local Board and Urban Sanitary Authority, *vice* McGhie, resigned.

WOLLSTEIN, Mr. John, has been appointed Collector to the Much Wenlock Local Board and Urban Sanitary Authority, Shropshire, at £15 per annum, *vice* Smith.

WOLSTENHOLME, Mr. Jeremiah, has been appointed Surveyor to the Town Council and Urban Sanitary Authority of Blackpool, at £300 per annum, *vice* Sunderland, resigned.

VACANCIES.

MEDICAL OFFICER OF HEALTH for the Leicester Urban Sanitary District; Medical Superintendent of the Fever Hospital, Public Analyst, and Police Surgeon: £500 per annum. Application, 23rd inst., to John Storey, Town Clerk.

TREASURER to the Wem Guardians and Rural Sanitary Authority.

SURVEYOR to the Colchester Town Council and Urban Sanitary Authority.

SURVEYOR to the Wilsden Local Board and Urban Sanitary Authority.

INSPECTOR OF NUISANCES for the Hartlepool Port Sanitary District: £80 per annum.

INSPECTOR OF NUISANCES for the Morpeth Rural Sanitary District: £60 per annum, from year to year. Application, 16th inst., to George Brumell, Clerk to the Authority.

COLLECTOR to the Burton-upon-Trent Town Council and Urban Sanitary Authority: £200 per annum. Application, 24th inst., to T. N. Whitehead, Town Clerk.

COLLECTOR to the Eiland Local Board and Urban Sanitary Authority.

COLLECTOR to the Yeaddon Local Board and Urban Sanitary Authority.

LOCAL INTELLIGENCE.

Upon the application of the East Grinstead Local Board and Urban Sanitary Authority, the enactment contained in the 90th sect. of the Public Health Act, relating to bye-laws as to houses let in lodgings, has been declared by the Local Government Board to be in force within the district.

The Sevenoaks Local Board and Urban Sanitary Authority have increased the salary of Mr. Jabez Mann, the surveyor, from £175 to £200, as from March 25, the commencement of the financial year.

The Chepping-Wycombe Town Council have increased the salary of the Town Clerk and Clerk to the Urban Sanitary Authority, from £150 to £200 per annum, and made him a special allowance of £100 for extra services in connection with the drainage works.

At a public meeting in the Court House, Buxton, on Wednesday, May 27, Captain E. L. Darwin, J.P., the late chairman for 124 years of the Local Board and Urban Sanitary Authority, was presented with an illuminated address, a gold watch and chain, and a purse of gold, subscribed for by 600 inhabitants of the town.

There were ninety-two applications for the Surveyorship to the Wednesbury Local Board and Urban Sanitary Authority, at £200 per annum.

The Woolwich Local Board and Urban Sanitary Authority have, upon the recommendation of a committee, increased the salary of the Clerk from £250 to £300 per annum, to take effect from March 25 last.

The Malvern Local Board and Urban Sanitary Authority have increased the salary of Mr. Fraser, the Assistant Surveyor, from £70 to £100 per annum.

The Guildford Guardians and Rural Sanitary Authority have been invested with urban sanitary powers, rights, &c., under sect. 156 of the Public Health Act, 1875, so far as it relates to naming streets and numbering houses, and to ruinous and dangerous buildings, with the contributory places of Purbright, Saint Nicholas Guildford, Stoke, and Woking, and of the Charterhouse, Crownpits, and Farncombe special drainage districts.

At the monthly meeting of the Basingstoke Town Council and Urban Sanitary Authority last month, a motion that the town clerk be paid a salary to include all legal expenses was referred to a committee of the whole council for consideration, and at the meeting on Thursday, the 4th inst., the following report was presented, read, and adopted:—“The committee (consisting of the whole council) beg to report that, having fully considered the subject of Mr. Smith’s motion, that the town clerk be paid a salary to include all legal expenses, are of opinion that the present arrangements of the duties of the town clerk and the mode of his remuneration have hitherto worked with advantage to the interests of the town, and the committee perceive no grounds for recommending any alteration therein. The committee take this opportunity of recording their sense of the efficient and faithful manner in which the present town clerk has at all times conducted the important duties and interests committed to his care. The town clerk thanked the council for the vote of confidence in him which was embodied in the concluding clause of the report, and pointed out that the items in the treasurer’s abstract under the head of ‘professional charges,’ and even under the head of ‘legal expenses,’ included many items which did not go into his pocket, and were bills from other professional men, and included also payments out of pocket for stamps, fees to counsel, &c.”

There were ninety-six applicants for the appointment of architect to the Town Council and Urban Sanitary Authority of Norwich, at £200 per annum, with offices, &c.

There were 190 applicants for the Blackburn surveyorship, at £120 per annum.

The Local Government Board have consented to the application of the Wellingborough Rural Sanitary Authority to be invested with urban powers, rights, &c., under Sects. 15 and 158, and the last part of Sect. 44, of the Public Health Act, in respect of the parish of Rushden; and will issue an order so soon as the necessary formalities have been complied with.

The Llanrwst Guardians and Rural Sanitary Authority have been invested with Urban powers, rights, &c., under Sect. 171 of the Public Health Act, 1875, so far as relates to hackney carriages, within the contributory places of Bettws y Coed, Dolwyddelan, Llanrhyllyn, Llanrwst, Penmachno, Trefriw, and Tre-Gwydir.

NOTES AND QUERIES.

Having for some time back been in the receipt of Queries appertaining strictly to sanitary work, and which it would be easy to answer, without having to refer our correspondent to competent professional advisers, we have opened a column in which to register such Queries and Replies thereto as can fairly be expected from us; and our subscribers and readers are invited to make such use of this column as will tend to benefit themselves and the community. Both Queries and Replies will, however, be subjected, if unnecessarily long, to a strict curtailment.

159. MUNICIPAL PROVISION OF GAS WORKS.

1. Sect. 161 of the Public Health Act of 1875 gives power to an urban authority to make and supply gas for both public and private purposes, and Sect. 162 gives them power to acquire by agreement the undertaking of any existing gas company. Are these powers new, and if not, since when have they been exercisable under older Acts?

2. What powers have rural authorities to provide their district with lighting?

BATSWINK.

1. These powers were first specifically given to urban authorities by the Act of 1875. Before that time they were compelled to apply to Parliament for a special Act for the purpose. 2. None as such. But they may apply to the Local Government Board for urban powers under Sect. 276, and, if successful, would then have all the lighting powers of an urban authority under Sects. 150, 152, 161, 162, and 163. If the rural authority had adopted the Watching and Lighting Act of the 4th William IV., and afterwards became urban, that Act would be superseded by Sect. 163 of the Public Health Act.—Ed.]

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